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An Address

ON

THE PREVENTION, DIAGNOSIS AND TREATMENT OF POST-OPERATIVE PERITONITIS*

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IN any study of inflammation of the peritoneum it is essential to bear in mind certain of its physical, anatomical, and physiological characteristics.

Its great extent, having an area approximately equal to that of the skin, renders a spreading inflammation in it a formidable affair. Its close relation to the various abdominal organs which it covers, largely or in part, exposes it to involvement in pathological lesions originating in any of them. For the same reason it is subject to movement caused by the peristaltic action of the hollow viscera which it covers. The movements of the diaphragm in respiration tend further to keep a portion of it, at least, in motion. In health it is capable of absorbing enormous quantities of fluids and passing them ultimately into the blood stream. The capacity of absorption of fluids is much greater in the upper part of the peritoneum than in that which occupies the lower abdomen and pelvis. The absorptive power is lessened in acute inflammation but still remains great.

When subjected to mechanical or chemical irritation it reacts as do other living tissues. It develops the phenomena of inflammation. It becomes reddened. There is local increase of heat. There is pain. There is exudation of serum. This exudate takes place from the surface, giving rise to free fluid in the peritoneal cavity and the formation of plastic lymph. It takes place also into the subserous tissue. This produces swelling. The subserous exudate, when it occurs in peritoneum overlying the intestine, interferes with the contraction of the muscle in the intestinal wall. Peristalsis in that part, therefore, becomes greatly lessened or ceases. The expansion of the gas in the intestine against an unresisting muscular wall causes distension of the affected coils of the bowel. The exudate on the peritoneal surface of the affected coils enables it to become adherent to adjacent coils or to any other structure such as the abdominal wall or the omentum which may be in its immediate proximity. This is nature's effort to keep the inflamed part fixed and at rest. At the same time this adhesive process forms a coffer-dam around the primary area of inflammation.

If no other factors enter into the case, in the form of bacteria, the inflammation does not tend to spread, but resolves more or less rapidly. A very familiar example of the phenomena thus roughly described is the reaction following an ordinary aseptic laparotomy, which produces inflammation from mechanical irritation. It is, however, with the spreading type of acute peritonitis that we are concerned. In this, pathogenic bacteria are always present.

The types of bacteria found include the streptococcus, *B. coli, S. albus, M. lanceolatus,* more rarely, *B. œrogenes capsulatus, pyocyaneus, pro-*

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teus, typhosus, and the pneumococcus and gonococcus. It may be of interest here to briefly refer to Flexner's report—quoted in Osler's *Practice of Medicine*—made over a quarter of a century ago, of a bacteriological study of 101 cases of peritonitis coming to autopsy in the Johns Hopkins Hospital. Of these twelve were of the so-called idiopathic form. They were terminal infections in cases of Bright's disease, gout and arterio-sclerosis. In these, the prevailing organism was the streptococcus. The second class followed operation on the peritoneum excluding operation on the intestine. The majority of these cases were examples of wound infection. They were thirty-three in number. The predominating micro-organism was the *S. aureus.* Next in order of frequency came the streptococcus and *B. coli communis.* The third class, comprising fifty-six cases, were instances of intestinal infection. The predominating micro-organism was the *B. coli communis* which occurred in forty-three cases, with the streptococcus a close second, being present in thirty-seven cases.

If we are to consider the prevention of this type of peritonitis we must study two questions. In the first place from what source are the bacteria derived which gain access to the peritoneal cavity? In the second place, having obtained entrance to the peritoneum, what are the conditions favourable for their propagation? Dealing with the first question, and ignoring the possibility of air contamination by pre-supposing that the spray from the mouth and nostrils of the operating staff and spectators is efficiently excluded by the wearing of masks, we can recognize four possible sources. In the first place we have the hands of the operating staff and the operating armamentarium which may be introduced into the abdomen, such as instruments, gauze, ligatures and so forth. The prevention of infection from this source is theoretically possible in 100 per cent of cases. In practice it depends on the mastery of aseptic technique acquired by the operating staff. Discussion of the details of this question is obviously outside the scope of this communication and will not be further referred to.

As the second possible source of infection we may consider the skin of the patient's abdomen. The frequent occurrence of the staphylococcus, which is always present in the skin, in the series of cases just referred to, would suggest this as a very important factor. Let us assume that the skin has been shaved and cleansed, without causing abrasions, and then sterilized by one of the accepted methods. By discarding the scalpel used in making the skin incision, as soon as it is made, and by immediately excluding the cut margins of skin by properly clipped towels and arranging the linen drapings so that the skin is not again touched until the final closing of the wound is to be made, we will probably do all that is possible to eliminate this as a source of infection.

A third possibility of infection lies in an infective focus in the patient's abdominal wall or abdominal cavity which is opened during the course of the operative attack. This will include a variety of conditions. On the one hand we have encysted collections of pus such as result from perforation of an inflamed appendix or abscess in the pelvis resulting from tubal infection. If the danger of spreading infection of the peritoneum is to be minimized in these cases, steps must be taken to prevent the soiling of the healthy peritoneum adjacent to them during operation. In some cases this may be accomplished by a carefully planned incision which enables the surgeon to deal with the infective focus without invading the healthy part of the abdominal cavity. In others the insertion of saline gauze packs will form a temporary cofferdam which will protect the healthy part of the abdominal cavity while the infective focus is being dealt with. In all of these cases the use of the suction apparatus, which is part of the equipment of every modern hospital, will be of great value in rapidly evacuating pus before it has time to overflow and contaminate the adjacent normal peritoneum. The use of drainage in these cases is a problem which must be decided on their individual merits. While no rule can be laid down which is applicable to all, there is no question, but that it should be used where particles of necrotic tissue have been left behind. If a drain is used it should be a drain not a plug, hence a gauze wick alone should never be used for this purpose. The most satisfactory drain is probably the rubber tube split in a spiral direction so that it is not so unyielding as to cause pressure necrosis.

A somewhat different problem confronts us in that large class where the intestinal tube is in-

cised. Here the potential source of the infection is the intestinal contents. It is obvious that every precaution should be taken to avoid spilling the intestinal contents and contamination of the peritoneum. Success in this is dependent on the technical ability of the operator to carefully plan the details of operation and skillfully carry them out.

One need only refer to one special operation to illustrate this point. If a tumour of the bowel is to be removed it will often be possible, by incising a fold of peritoneum, to lift the mass outside of the abdomen; the careful placing of gauze packs excludes it from the rest of the peritoneum and the work of excision can be carried out extra-peritoneally. Careful application of clamps and the use of suction as soon as the incision in the bowel is made, will diminish the chance of soiling with liquid bowel contents. The use of the cautery knife when possible in dividing the bowel wall, so as to automatically sterilize the incision, lessens the likelihood of contamination when the sutures are inserted to complete the anastomosis. It goes without saying that in suturing for anastomosis a watertight closure must be made. In this connection it is important that the peritoneal sutures should not penetrate the mucous coat, and provide a track for leakage. But why go further into detail? Any and every trick of technique which aids in preventing contamination with intestinal contents is of value in preventing peritonitis.

For many years surgeons have regarded the occurrence of fatal post-operative peritonitis as being directly due either to failure to maintain asepsis throughout the operation or to an avoidable technical error in operative manipulation. It is well that this attitude should remain. At the same time the possibility of peritoneal infection from a distant septic focus is one which merits thoughtful consideration. In the Flexner series approximately 12 per cent were of the so-called idiopathic type. The peritoneal cavity had not been subjected to operation. They were cases where the defensive mechanism of the body had been so weakened by chronic disease that pathogenic organisms were permitted to migrate from more or less distant septic foci to the peritoneal cavity and multiply there. Is it not possible that in the unexplainable cases of peritonitis following a "clean" laparotomy, the shock of operation has been sufficient to so demoralize the bodily defenses that organisms have been able to leave septic foci where they had been segregated and travel in the blood stream to the injured peritoneum where they found a fertile soil for growth?

If we accept this suggestion as a reasonable explanation it will prove to be, not a convenient alibi to exonerate us from responsibility, but will rather raise an awkward question. Why did we not first take steps to clean up the septic foci in the patient's mouth or upper air passages or elsewhere before subjecting him to an abdominal section? It is true that in many cases laparotomy has to be performed as an emergency. We have to accept the patient as he is with all his handicaps. It is also true that in many more cases the abdominal operation may profitably be postponed until an attempt is made to clean up discoverable septic foci. Cases who have recently suffered from an acute infection such as influenza, in which so frequently there is a streptococcal infection of the upper respiratory passages might well have operation postponed, not merely until the acute infection has subsided, but until the bodily forces have had time to become stabilized.

In spite of precautions some contamination of the peritoneum will occur. In by no means all of these will a spreading peritonitis develop. In most of them the peritoneum will rapidly absorb the organisms. The patient goes on and makes a satisfactory recovery. Why does not this occur in all? Here, as elsewhere, the reaction to bacterial invasion depends on the size and virulence of the dose of bacteria, the resistance of the patient, and the presence or absence of a suitable culture medium.

To what extent can we control these conditions? In the rapidly fatal cases it is probable that the quantity of infection has been so high that the patient is overwhelmed before the defensive forces can be brought into action. The dose of infection may be best controlled by the measures already referred to in addition to the removal of gross infective foci such as a gangrenous or perforated appendix. The farmer and the gardener ensure rapid and luxuriant growth of the seed by providing a well prepared soil. Conversely the surgeon seeks to avoid the suitable culture medium; or if you like, the prepared soil.

A good many years ago, Halstead found in

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experimental work on dogs, that a definite quantity of a culture of streptococcus deposited in the peritoneal cavity of a dog might fail to produce peritonitis. If, however, an equal quantity was inserted and at the same time a sterile blood clot or piece of potato were left in the peritoneal cavity, peritonitis would develop. Attempts to produce experimental peritonitis in dogs by injecting a culture of streptococci may fail if it is done gently. If on the other hand the parietal or visceral peritoneum is abraded by rubbing with gauze it will almost always succeed. From these experiments we can draw useful lessons. Rough handling of the intestine, forcible packing with gauze, tearing apart of adhesions instead of clean cutting with a sharp knife, exposure of the intestine to the dessicating effect of the air, all result in leaving a devitalized surface. This presents an excellent "prepared soil" for the growth of bacteria. A stump of pedicle, controlled by ligature *en masse*, leaves a dead tissue in which bacteria can flourish, clots of blood left in the abdomen, especially if during operation the intestinal tube has been opened, most decidedly increase the likelihood of peritonitis. In addition it is worth bearing in mind that although the bacteria in the intestine will not migrate through the uninjured intestinal wall, it is very probable that they may pass through a wall seriously injured by pinching and rough handling. Among the measures which aid the surgeon greatly in avoiding unnecessary bruising of the intestine, one may instance posture. An example of this is the reversed Trendelenberg position in operating on the biliary tract. This permits the intestine to gravitate away from the field of operation and enables one to avoid excessive force in packing with gauze. Of even greater value is the proper preliminary preparation so that the patient comes to operation with the intestines comparatively empty.

The problem of estimating the power of resisting infection in a given individual, is an elusive one. At the same time the lowered power of resistance of many is fairly obvious. One may instance the person suffering from anæmia, resulting from hæmorrhage from a gastric or duodenal ulcer or cancer of the large intestine. These may be tremendously improved by a preliminary transfusion of blood. The patient with damaged kidneys may often be greatly improved by rest in bed and administration of large quantities of water together with suitable diet. In all chronic cases who have become debilitated by their disease or by hard work or a combination of these two factors, resistance will be raised by a few days' rest in bed, carefully supervised diet, of a character which will lessen intestinal putrefaction, and elimination of toxic products by administration of large quantities of water.

The preliminary cleansing of the intestinal tract should not be casually dismissed by ordering a purgative. In my opinion, the preliminary purgation of the laparotomy patient need be mentioned only to be condemned. Purgation has been proven to increase the fluidity of the contents of the large intestine with increased virulence of the intestinal flora. Following it, there is increased tendency to gaseous distension. The patient is weakened by purgation and the vital resistance is lowered. A better preparation can be secured by repeated saline enemas, or in exceptional cases, by administration of some of the familiar irritating enemas. The patient is not weakened thereby. Apart from this, distended coils of intestine compels violent manipulation to keep them within the abdominal cavity and undoubtedly rough handling of the intestine favours the occurrence of post-operative peritonitis. It may result only in the simple traumatic peritonitis producing the so-called adynamic ileus. It may however, by preparing suitable soil for the growth of bacteria result in a spreading suppurative peritonitis.

As a further measure of increasing resistance there may be something to be said in favour of preliminary digitalization of selected cases. At the close of an exhausting operation when the pulse tends to become rapid, it may be a useful measure to administer a massive dose of digitalis per rectum. In deciding on such a course, the co-operation of an experienced internist is of the greatest assistance.

Diagnosis.—The diagnosis of acute post-operative peritonitis is not always as easy in practice as it is on paper. In the average case signs appear within the first seventy-two hours. The abdominal pain is in excess of the usual post-operative pain and tends to become progressively worse. The patient lies with the legs drawn up so as to relax the abdominal tension. Vomiting persists beyond the usual post-anæsthetic period. The vomitus at first is small in quantity but

soon takes on a dark brown or green colour and becomes more profuse. The pulse instead of falling during the second or third day, increases in rapidity, rising to 120 or 140 or higher. It is small and hard, later becoming weak and thready, and finally imperceptible. Coincident with the rising pulse there is, owing to the toxæmia, relaxation of the walls of the peripheral vessels. This produces a gradually increasing cyanosis more noticeable at first in the finger tips but gradually spreading over the extremities. Meantime, owing to intestinal paresis there is increasing abdominal distension. The abdominal muscles are rigid and there is marked tenderness. As a result respiration is interfered with. It becomes altogether thoracic and very rapid. The patient is restless and unable to sleep. Temperature may show a sharp rise followed by a fall and then a slight degree of pyrexia not in keeping with the pulse rate. Hiccough is usually a late sign. In some cases it occurs early. The leucocyte count is of little value as a diagnostic measure. It may be very high in cases where a good fight is being put up. It may be very low in cases which are overwhelmed with the infection.

It must be borne in mind that many cases run an atypical course. Some few cases run an afebrile course throughout. In elderly or debilitated cases, whose resistance is low, pain may not be marked. In the diagnosis we must keep in mind certain other conditions which present some of the symptoms just mentioned.

Pain may be an outstanding feature in obstruction. Here, however, the pain is of an intermittent character, rising to a peak and fading away. It is coincident with the peristaltic effort to overcome the obstruction. On auscultation at this time boborygmi can be heard. They are absent in peritonitis. In obstruction there is not the exquisite tenderness to abdominal palpation which is usual in peritonitis. Furthermore mechanical obstruction occurring after a laparotomy is usually a late complication. It occurs as a rule not earlier than the fifth or seventh day. Acute peritonitis develops within the first three days. In obstruction the pulse rate as a rule is slow. In acute peritonitis it is almost invariably rapid. Pain may be due to wound infection. It may be associated with rapid pulse and less frequently with vomiting. Abdominal examination will usually show some puffiness of the wound. There will be local tenderness without the general splinting of the abdominal muscles found with peritonitis. The removal of a stitch and the separation of the edges of the wound by inserting a probe will usually establish the diagnosis.

The development of a basal pleurisy or diaphragmatic pleurisy after operation may give rise to pain, referred to the abdomen. The pulse may be rapid. There may be slight cyanosis. There may be some spasm of the abdominal muscles and for some hours it may be impossible to make a differential diagnosis. The grunting type of respiration and careful auscultation of the chest, aid in settling the doubt in the case of pain referred from an inflamed pleura.

Vomiting beyond the ordinary post-anæsthetic period may in rare instances be due to an acute dilatation of the stomach. Associated with this also are intense thirst and increasingly rapid pulse rate. The character of the vomiting is different from that of acute peritonitis. Large quantities, as much as a basin full at a time, of dark fluid are expelled or rather regurgitated. Usually there is little pain. Abdominal inspection shows a fullness in the upper abdomen rather than the general meteorism of peritonitis. There is absence of excessive tenderness. The passage of a stomach tube will in any event be beneficial and in the case of dilatation of the stomach will clear up the diagnosis at once as well as being the appropriate treatment for the condition.

Hiccough may occur in many other conditions than peritonitis. Only when it is associated with the other signs of peritonitis can it be regarded as part of the symptom complex. When it is present it is usually of ill omen.

Treatment.—Having satisfied oneself of the presence of spreading peritonitis what form of treatment is to be adopted? If one can feel certain that at operation the pathological condition attacked had been satisfactorily dealt with: if for example the infective focus, such as appendix, pus tubes, or what not, had been removed; if adequate closure of any openings made into the intestinal tube had been accomplished; if secure ligation of blood vessels sectioned during the operation had been done, there can be no advantage in reopening the wound to drain the peritoneal cavity. One cannot hope to control the spread of infection by the insertion of

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drains except in the case where a localized collection of pus has to be dealt with. In the treatment of peritonitis two plans have been advocated. Each is diametrically opposed in principle to the other.

Lawson Tait, the pioneer of abdominal surgery, used early purgation in all of his cases. He rarely had a post-operative spreading peritonitis. He was an exceptionally rapid and clean operator. He did not traumatize tissues. One group of surgeons conclude that he avoided peritonitis because he used early purgation. They, therefore argue that the best treatment for peritonitis is purgation. It will if accomplished, drive out of the intestine the toxic products so that they will not be absorbed. The distending gases are expelled so that the diaphragm and the heart are not embarrassed. Water and liquid nourishment are administered by mouth. The opposing school point out a grave objection to this method of treatment. Stimulation of peristalsis by purgatives whether administered by mouth or rectum or subcutaneously, brings about a wide dissemination of any free infective material in the peritoneal cavity anywhere above the pelvis.

That this is a fact has been demonstrated by experiments on dogs. An opaque substance such as lampblack is injected into the peritoneum. The dog is given a purgative. Following the action of the purgative if the dog is killed the lampblack can be found widely disseminated throughout the peritoneal cavity. Ample clinical demonstration has been afforded in thousands of cases of perforating appendicitis in which the administration of a purge has produced a spreading peritonitis. To obviate the tendency to spread of infection, a line of treatment advocated first by Ochsner and elaborated by Murphy and Fowler is used by many surgeons. It consists in enforced rest of the peritoneal surfaces by diminishing peristalsis, and in posture to favour drainage of infection into the pelvis where the absorptive power of the peritoneum is least, and in elimination of toxins by introducing large quantities of water into the blood stream.

In carrying out this plan at the earliest sign of peritonitis or in cases where it is felt that peritonitis is likely to develop, the patient's stomach is washed out to ensure that it is empty. He is not allowed to swallow anything—not even water. This alone reduces peristalsis. Neither purgatives nor enemas are given. He has the head of the bed raised, or is placed on a Fowler bed. Water in the form of normal saline, or soda bicarbonate and glucose solution is administered continuously by the rectum according to the Murphy method. This is supplemented in severe cases by normal saline or glucose solution or both, introduced intravenously. This flushes out toxins. In these cases the objections frequently voiced to the administration of large quantities of saline intravenously should not deter one from using it. Unless water can be got into these people, they will die.

If the fluid is introduced under rigid asepsis and so slowly that the blood pressure is not raised above the normal average for the individual, it is not likely to be harmful. We have frequently given in this way 5000 c.c. and upwards in twenty-four hours, in addition to what was absorbed per rectum, with the most happy results.

Pain and restlessness should be controlled by morphine administered as often as required. This has the advantage of further lessening peristalsis during the acute stage and diminishing the frequency of the respiratory movements which tend to pump the infection through the peritoneal cavity. In cases which do well, under this treatment the pulse becomes reduced in frequency, flatus is expelled spontaneously, distension gradually lessens and there is a return of a feeling of well-being as the inflammatory process undergoes resolution. In all these, careful watch must be maintained for signs of localized abscess in the pelvis. Tenesmus and passage of mucus call attention to the need of digital rectal examination, as these are frequently the signs of the irritation of a pelvic abscess. When this occurs it should be drained.

In a considerable percentage of cases the treatment outlined is sufficient. In many others, however, another factor has to be reckoned with. The local cessation of the peristalsis which nature initiates as a curative measure, if too long continued, gives rise to the development of toxic products within the intestine which adds to the toxæmia. We have a condition very similar to that of acute intestinal obstruction. It would be a most

desirable thing if we could be rid of this putrescent mass without at the same time disturbing the delicate adhesive process which nature has set up. The drainage of the healthy intestine above the level of the peritonitis by an enterostomy as suggested by Victor Bonney is theoretically sound practice. The entero-colostomy suggested by Sampson Handley to attain the same end would seem to add too heavy an operative strain to an already overburdened patient to meet with very widespread acceptance. In a case which does not appear to favourably respond to the treatment just outlined and when distension and vomiting is increasing, the performance of an enterostomy must be considered, but it requires delicate judgment to decide whether the added shock of even this small operative procedure is justifiable.

Two other measures in recent years in the treatment of acute peritonitis are worth referring to. The drainage of the thoracic duct suggested by Costain gave rise to hopes that it might prove to be of value. Animal experiments have failed to prove that it drains bacteria from the peritoneum or that it prevents death from peritonitis. Its clinical value is by no means proven. Further work will have to be done before it can be either discarded or adopted as a therapeutic measure in the human subject.

The intravenous injection of antiseptics such as mercurochrome and gentian violet has not yielded the results in peritonitis which its enthusiastic advocates would lead us to expect. Published reports of experimental work on animals would incline us to come to the conclusion that this method, at present, is of doubtful value.

Vaccines may in the future be a valuable aid. At present in this condition they are of very doubtful value. There are two barriers to their scientific application. In the first place it is frequently impossible to be certain of the identity of the infecting organism. In the second place when the organism can be found, the time required to prepare an autogenous vaccine is so great that the disease has either begun to subside or has advanced to a stage when it is beyond control, by the time the vaccine is ready for use.

Unfortunately we must all recognize that a certain type of post-operative peritonitis, notably the virulent streptococcic peritonitis will frequently not respond to any form of treatment.

To sum up the treatment in a Hibernianism, the best treatment of post-operative peritonitis is its prevention. Next in order of value is the early institution of such post-operative care as will inhibit the spread of any infection which may have been deposited in the peritoneal cavity.

The Quack in the 18th Century.—"No laws will ever be able to prevent quackery, while people believe that the quack is as honest a man, and as well qualified, as the physician. A very small degree of medical knowledge, however, would be sufficient to break this spell; and nothing else can effectually undeceive them. It is the ignorance and credulity of the multitude, with regard to medicine, which renders them such an easy prey to every one who has the hardiness to attack them on this quarter. Nor can the evil be remedied by any other means but making them wiser."

This is from the introduction to the eighth edition (1784) of the celebrated *Domestic Medicine* of William Buchan, a work which was received by the medical profession of that time with mingled acclaim and disapproval. "Many whose learning and liberality of sentiments do honour to medicine received the book in a manner which at once shewed their indulgence, and the falsity of the opinion, that every physician wishes to conceal his art; while the more selfish and narrow-minded, generally the most numerous in every profession, have not failed to persecute both the book and its author." The quoted comment is that of Buchan.—W. H. H.

The psychical side of man constitutes a factor which highly complicates the action of all remedies in the pharmacopœia.—Anon.

An Address

ON

THE PRESENT STATUS OF SERUM THERAPY IN THE TREATMENT OF THE EXANTHEMATA*

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THE exanthemata or eruptive fevers constitute a group of clinical entities which have the following features in common:

1. The appearance, during the course of an attack, of an exanthema or rash. Occasionally, a case occurs in which this symptom is wanting or at any rate not observed.

2. All are due to the invasion of living micro-organisms.

3. Exanthemata are transmissible from one individual to another.

4. A number of them are susceptible to specific serum treatment.

The exanthemata may be said to include the following: cerebro-spinal meningitis, dengue, erysipelas, glanders, German measles, scarlet fever, smallpox, typhoid fever, typhus fever, vaccinia, chickenpox. Antitoxins or anti-sera are or have been used in the treatment of: cerebro-spinal meningitis, erysipelas, measles, scarlet fever, and typhoid fever.

Specific serum therapy is of recent development. In 1890 von Behring prepared diphtheria antitoxin. This was the first specific serum. In 1894 Roux and Martin presented the evidence which indicated that the introduction of antitoxin treatment of diphtheria marked the opening of a new era in the history of therapeutics. Thirty-two years have since elapsed. In that time substantial progress has been made. Some of the limitations of serum treatment have been established. Fresh interest in the subject, however, has been aroused as a result of contributions made during the past two or three years.

A brief review of earlier work and a summary of the present position of specific treatment of cerebro-spinal (meningococcus) meningitis, erysipelas, measles, scarlet fever and typhoid fever will now be undertaken.

Cerebro-spinal (meningococcus) meningitis.—Beginning in 1905, Jochmann and Kolle and Wassermann in Germany and Park in the United States prepared anti-meningococic sera and reported the results obtained in the treatment of limited groups of cases. In the same year, Flexner and his associates initiated experimental work which was carried on for several years and finally resulted in a sound scientific basis being established for the clinical use of anti-meningococcic sera. In addition, Flexner and Jobling, Dopter, Netter, Gardner Robb, and others reported the results obtained in the treatment of large groups of cases. Certain facts were quickly established. Among the more significant of these were:

I. In untreated cases of meningococcus meningitis in various epidemics the case fatality rate was 70 to 81 per cent, while among treated cases it was about 30 per cent.

2. Potent anti-meningococcic sera contain opsonins which facilitate phagocyosis, bactericidal substances which destroy meningococci directly, and probably also anti-endotoxins and agglutinins.

3. The therapeutic efficacy of these sera may be determined with a reasonable degree of accuracy.

It was also learned that, while, as a rule, if serum treatment was undertaken early (preferably on the first day on which the symptoms were observed) gratifying results were obtained in the great majority of cases, occasionally it was recorded that patients failed to respond to serum treatment even when it was begun on the first day of the disease, and when abundant and presumably potent serum was administered.

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* Read at the Cleveland Assembly of the Inter-State Post Graduate Medical Association of North America, October 21, 1926.

In consequence, it was recommended that the horses used for the production of anti-meningococcic sera be given injections of a considerable number of different strains of the micro-organism. This was the usual procedure until 1918-19, when Gordon and others suggested that monovalent rather than polyvalent serum might be preferable. Such monovalent sera have been employed in the United Kingdom with a certain degree of success, apparently. In the United States and Canada, polyvalent sera only have been used. Just recently (July 1926) Wadsworth and Kirkbride[1] have published the results of a combined clinical and laboratory study. They conclude that "the immunization of horses with six selected representative strains (of meningococci) apparently produces sera of higher titre and polyvalency than with a larger or smaller number of strains."

With reference to the treatment of a patient presenting signs of meningeal irritation, it is essential that lumbar puncture should be performed as soon as possible; that, in the presence of a turbid fluid or demonstrable meningococci, serum should be injected into the spinal canal at once in amounts only slightly less than those of the fluid withdrawn. Early free drainage relieves pressure and is of itself beneficial. The patient can most often be treated successfully if lumbar puncture is done and serum administered under an anæsthetic. Serum treatment will, of course, be unavailing if the etiological agent is found to be any species of bacteria other than the meningococcus. Treatment will be of no avail frequently in cases of "closed meningitis," where the foramen of Magendie is blocked and communication between the intra-ventricular and sub-arachnoidal spaces interrupted. In these circumstances the injection of serum into the ventricles after trephining or cistern puncture may be resorted to.

It occasionally happens that a patient suffering from meningococcus meningitis and progressing satisfactorily under specific serum treatment quite suddenly presents alarming symptoms, fails to respond to further treatment and quickly dies. At autopsy or even before, such cases may show pneumococci as well as meningococci in the cerebro-spinal fluid. These cases of "mixed infection" meningitis result fatally as a rule. It is a good practice, whenever it is at all possible, to examine macroscopically and microscopically some of each lot of cerebro-spinal fluid withdrawn during the progress of the illness. Cases of hæmorrhagic meningococcic meningitis usually run a rapidly fatal course and do not respond to treatment. Such cases may give rise to difficulties in diagnosis. Experience gained during the Great War emphasized anew lessons learned earlier but sometimes forgotten, namely, that the most important considerations are suitable preventive measures; then when these fail, immediate lumbar puncture and early vigorous serum treatment of meningococcus meningitis should be attempted in every patient presenting the clinical picture, preferably with the patient under an anæsthetic while lumber puncture is being done and the serum administered.

Erysipelas.—Anti-streptococcic serum has for many years past been used in the treatment of erysipelas with apparently more or less indifferent results. Birkhaug[2] believes he has recently established (1925-26) that a specific relationship exists between *S. erysipelatis* and erysipelas, and that this micro-organism elaborates a specific antitoxin which neutralizes the exotoxin of *S. erysipelatis*. Furthermore, Birkhaug has been unable to neutralize erysipelas exotoxin with scarlet fever antitoxin. Susceptible persons will react to the intracutaneous injection of small amounts of *S. erysipelatis* toxin and convalescent erysipelas serum will neutralize this toxin. The results obtained in the treatment of sixty cases of erysipelas with erysipelas antistreptococcic serum, have also been reported by Birkhaug who concluded: "Clinical trials in sixty moderately severe cases of erysipelas have demonstrated that intramuscular injection of erysipelas antistreptococcic serum, in amounts of 100 c.c. of the unconcentrated and from 15 to 20 c.c. of the concentrated serum, when administered during the first three days of the disease, causes a prompt amelioration of toxic depression, a critical fall in temperature and pulse rate, prompt fading of the erysipelatous lesion and rapid absorption of the blebs and œdema within the affected areas." Further reports on the results obtained in the use of this serum will be awaited with interest.

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Measles.—Nicolle and Conseil in 1918 published the results obtained by them in a series of children who, after exposure to measles, were given a prophylactic dose of human convalescent measles serum. Very considerable interest has been manifested in this procedure and numerous communications reporting results have appeared. The work of Degkwitz has been especially interesting and his communications should be consulted. The literature up to 1924 was summarized by Zingher in an article published in that year. In that communication he detailed the methods employed in the Health Department of New York City to obtain serum. Specific recommendations for the use of human convalescent measles serum, as well as the results obtained in a series of 160 exposed persons were also set forth by Zingher.[3] These results were summarized by him as follows:

"Convalescent measles serum, plasma or whole blood has definite value in the prophylaxis of measles. It can be used to produce complete passive immunity, if injected within the first four or five days after exposure. It can be injected to modify the character of the disease rather than to prevent its development."

Doses of 2.5 c.c. to 7.5 c.c. of serum for children of three years of age were recommended. In the group of 102 non-immunes reported in this paper, ninety-two, injected after exposure, were apparently protected, while nine developed measles.

Still more recently (August 1926) Park and Freeman[4] and Haas and Blum[5] report results obtained in the prophylactic use of human convalescent measles serum in 1500 and 174 children respectively. Convalescent blood was withdrawn between the ninth and twenty-first day after the temperature had become normal. In certain instances, blood was withdrawn as late as five months after recovery. Park and Freeman recommend the injection of 6 c.c. of convalescent serum or plasma into children under three years of age and from 6 c.c. to 10 c.c. for children over three years of age who have been exposed to measles five days (or less) previously. Park and Freeman emphasize as their experience that the administration of convalescent measles serum, if it does not prevent, will so modify the attack that it will be very mild and not likely lead to complications Thus measles convalescent serum in the light of these results may be regarded as a valuable therapeutic agent which, when used promptly before the seventh day after exposure, will prevent the development of serious complications such as broncho-pneumonia, bronchitis, etc.

Townsend[6] (1926) in reporting upon the results obtained in the use of measles convalescent serum states: "thirty-two cases who received convalescent blood, at least eight days before the development of the rash, showed an average febrile period of 3.6 days, whereas twenty-one unprotected boys showed an average febrile period of 6.4 days." There were no complications in the group of thirty-two, whereas, in the uninoculated group of twenty-one, there was one case of broncho-pneumonia, one of otitis media, one of frontal sinusitis and one of external otitis. Townsend especially emphasizes the mild character of the disease among many of the boys who were inoculated. The practical difficulty of obtaining adequate supplies of human convalescent measles serum prevents the widespread employment of this method of specific serum therapy. For this reason, the recent work of Tunnicliff[7] and Ferry and Fisher[8] has received considerable attention. In a word, these workers claim that a variety of *S. viridans* is the etiological agent of measles. Ferry and Fisher have designated it *S. morbilli.* Tunnicliff and Ferry and Fisher claim to have established the fact that this streptococcus elaborates an exotoxin which gives a positive skin reaction in those susceptible to measles but not in those immune to the disease. Tunnicliff and Taylor[9] believe that intracellular toxin is more useful than extracellular in the measles skin test. These workers claim also that they have produced a specific antitoxin against the toxin of *S. morbilli.* The widespread employment of measles antitoxin in a large series of cases with proper controls is esssential before any conclusions can be drawn as to its value in the specific serum therapy of the disease.

Just recently an article on "Measles prophylaxis" by Hoyne and Gasul[10] has appeared. They report the results obtained using immune goat serum. They summarize their results thus:

"There were forty-eight infants and children with definite exposures to measles. Serum was administered to thirty-nine. Thirty-four of these were protected from measles and five developed the disease in a mild form. There was no death or complication in any of the five cases and, in some instances, the rectal temperature

did not exceed 100° F. The incubation periods were twenty, thirty-three, thirty-three, eight and sixteen days, respectively. The prolonged time in some of these suggests the possibility of second exposures. Among the nine contacts who did not receive serum, all but one contracted measles. In the unprotected eight having measles, there were two deaths.

Of the total immunized, 12.8 per cent developed measles in an attenuated form. In the unimmunized, 88.8 per cent acquired measles, with a mortality of 25 per cent. Serum rashes occurred in only 13 per cent of the cases and persisted for only one or two days. No untoward reaction of any kind was evident in the serum receptors.

Tunnicliff's immune measles serum has been, in our experience, of definite value as a prophylactic for measles. If the serum is administered to contacts not later than the fifth day of exposure, always counting the date of onset as the first day of the disease, protection seems assured in about 90 per cent."

Scarlet fever.—Moser in 1902 and Gabrichevsky and Savchenko in 1905 introduced scarlet fever serum into Austria and Russia respectively. Despite the appearance of several important articles in the Russian and German literature in 1905 and 1906, the opinion was very generally held that human scarlet fever convalescent serum was much superior as a therapeutic agent to such scarlet fever sera as were then available. Only the difficulties incidental to obtaining adequate supplies interfered with the widespread use of scarlet fever convalescent serum. Its value was definitely shown in the published results of Weisbecker, Reiss and Jungmann, Zingher, Kling, Widfelt, Weaver, Hannah and many others.

In 1917 Schultz and Charlton demonstrated the phenomenon of blanching. Convalescent scarlet fever serum introduced intracutaneously into the skin of a patient with a fully developed rash caused the latter to fade at the site of injection. That was evidence of specific antitoxin neutralization of the toxin in the skin of the patient so treated. This observation was followed by an important series of papers on the bacteriology of scarlet fever, and finally the work of the Dicks and of Dochez has established specific serum therapy in scarlet fever on a secure foundation.

What are the indications for the employment of scarlet fever streptococcus serum or scarlet fever antitoxin and what benefits will accrue to the patient when such treatment is carried out? Blake and Trask[11] have published results obtained in the treatment of patients with Dochez serum. G. F. and G. H. Dick[12] have also recorded results obtained where scarlet fever antitoxin prepared by their methods was used. Gardner Robb in Belfast, Cushing in Montreal and Hannah in Toronto have recently published their observations in large series of cases treated with specific scarlet fever serum or antitoxin. Cushing[13] treated 500 cases with antitoxin during the year 1925-1926. Of these about 5 per cent were classified as severe cases, the others as moderate or mild. During the previous year Cushing had under his charge over 100 cases of practically the same types of cases not treated with serum. This constituted a control group. An additional control group of 300 was observed at the same time as specific serum treatment was given to the group of 500 patients.

The rule in treatment was to give a full dose of serum to every definite case of scarlet fever on admission unless the case was extremely mild (temperature less than 100° F.), or when there was a history of asthma or idiosyncrasy to horse serum. Cushing states that the most constant and certain action of the serum is to produce a marked fall in temperature. A similar favourable effect on the pulse rate is observed. The eruption fades very quickly, a great improvement is manifested in the toxic symptoms, namely; rash, delirium, headache, joint-pains,etc. Cushing emphasizes that all observers are agreed that the administration of adequate doses of potent scarlet fever antitoxin will cut short or abort the first week's fever.

Cushing's observations on the effect of serum on the complications are also of interest. During 1926 in a series of 1073 cases, 45 per cent developed complications, whereas in those treated with the antitoxin 25 per cent only suffered from sequelæ. Without serum, otitis media as a complication developed in 14 per cent of patients, whereas in the serum-treated group only 8 per cent developed middle ear disease. Similar favourable results were noted in respect of other complications. The case fatality-rate among scarlet fever patients under Cushing's care in 1924-25-26 has fallen from 3.5 to 1.2 per cent. Cushing believes that scarlet fever antitoxin should be administered to every case of the disease at the earliest possible moment. The dose of concentrated serum most generally recommended is from 15 c.c. to 30 c.c. repeated promptly if necessary.

Of the serum treatment of *typhoid fever*, only

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a word need be said. Chantemesse introduced a specific anti-typhoid serum which has had a very limited field of usefulness. Absolute control and elimination of typhoid fever through sanitary effort and specific prevention by means of typhoid vaccination have been found to be the correct solution of the problem of typhoid fever. Since it is literally a vanishing disease, efforts toward prevention rather than treatment should concern us.

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An Address

ON

THE PSYCHOGENIC PSYCHOSES: THEIR CAUSES AND SYMPTOMS

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THE chief members of this group are dementia præcox, now commonly known as schizophrenia and manic-depressive psychosis including involution melancholia. These account for about 50 per cent of the admissions to mental hospitals. These conditions are allied to the neuroses and psycho-neuroses and so far as is known they are not the result of cerebral intoxication or other demonstrable lesion of the brain.

The chief predisposing cause is what is commonly known as defective heredity. Defective heredity is a relative term and has no definite boundaries. In so far as the psychoses are concerned, the defects in the near relatives which might indicate that a given person had not been fully endowed qualitatively at birth, would be the psychoses themselves, marked eccentricity, alcoholic excesses and suicides. If this defect is passed on to the next generation, it shows itself in the character of the individual and the way in which he reacts to given circumstances. A limitation is placed on him for a well-rounded adaptable life. That is all defective heredity means. Insanity is not inherited. It can be compared readily with tuberculosis. An individual does not inherit tuberculosis from tubercular parents, but he may inherit a poorly developed body and a low resistance to disease. Similarly an individual does not inherit mental disease, but inherits a weak mental constitution and poor resistance to the factors which might excite a psychosis.

The other important predisposing factor is improper training and poor environmental conditions for the developing child. It is often very difficult to be certain whether a certain characteristic is the result of an inherited defect, or due to the training or lack of training it has received from those about him. Kempf[1] questions whether there is such a thing as inherited predisposition, and is inclined to take the ground that peculiarities in the child are more likely conditioned by an unconscious imitation of the

peculiarities in the parent, or the moulding of the child by the parent. We do know that individuals who develop psychoses frequently have had an unfortunate home life during the developmental years, being forced to associate with persons definitely peculiar, receiving too much or too little affection, and lacking the training which should enable them to develop their personalities, solve difficulties and shoulder responsibilities. They are thus brought to maturity lacking the ability to make a well-rounded adaptation to life and its problems, lacking confidence, easily discouraged, taking refuge from reality in unrealities.

There is thus a large group of people who at maturity or even before it find difficulty making a proper adaptation to the situations which confront them. These psychoses may be regarded as a failure at adjustment and closely allied to the crippling hysterical mechanism, the defense neurotic reaction, occasional or frequent alcoholic excesses and actual suicidal attempts. These are all inferior ways of reacting to distressing circumstances, and the differences in reaction depend on qualitative differences of inheritance, constitutional factors and the degree of personal development one attains. One individual, for example, facing an intolerable situation might gain temporary relief in alcohol, another by an hysterical paralysis, another might see no relief except in suicide and escaping forever. There are others however who, not being able to satisfactorily solve their difficulties, and not caring for any of these reactions, develop a psychosis, a world of fantasy in which they escape from the distressing situation and find contentment. Seeking contentment, or at least equilibrium, is one great object, if not the greatest, in living, and as individuals we are constantly trying to mould our environment, or to mould ourselves in the pursuit of happiness.

What situations could be so distressing as to cause one of these major maladjustments? Constant brooding over some secret sin, a keen sense of physical inferiority, prolonged fear and anxiety, hopeless love, unhappy marriage, desperate economic condition and outlook, or unattainable desire. The emotional stresses of an acute nature are not nearly so pathogenic, although frequently blamed for a breakdown. The death of a near relative, temporary financial difficulties, enforced change of home, broken engagements, etc., are examples of this acute stress. More commonly it is the emotional stresses that are not so easily seen which are more important. It should be remembered that emotional stresses are just as infective and harm-producing as bacteria, and they may produce even grave physical lesions as demonstrated so effectively by the researches of Pavlow[2] and Cannon[3].

The rôle of infection as a possible etiological factor in the psychoses has been one of considerable argument especially during recent years. There have been those, led by Cotton[4] who would attribute these psychoses entirely to infection, especially focal infection. They would make the symptoms correspond to the delirium produced by the general infections, and they have sought to remedy these conditions by eliminating the foci and counteracting the toxins produced by sera and vaccines. That this is an extreme view is the opinion of the great majority of psychiatrists, and certain workers, notably Kopeloff[5], using Cotton's methods was unable to corroborate his findings and as a matter of fact had no better results in his operative cases, than in a series of controls on whom no operation took place. To look on mental symptoms simply as the result of infection is to ignore the tremendously important factors of heredity, environment and emotional stresses. One cannot on the other hand say that infections are of no moment, but it would be more logical to regard them as influences which lower an individual's resistance, and perhaps give him less power to keep disturbing stresses successfully repressed or sublimated. When it is further considered that the great majority of individuals harbor some focal infections without developing a psychosis, one is the more convinced that infections or bodily disease are relatively unimportant factors. This point of view has considerable practical importance when one considers the great amount of unnecessary surgery to which these patients are subjected. Surgery should be resorted to only when there is conclusive evidence that a toxæmia is being produced, and there is good reason for concluding that it may be an etiological factor; moreover, it should be undertaken only when the patient is physically in good health, and able to withstand an operation.

It should not be forgotten that an operation has, as an immediate effect, a lowering and ex-

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hausting influence and may only add to the burdens which the patient is already carrying, and may actually aggravate the mental symptoms. Involution melancholia, for example, not infrequently follows a severe physical trauma, whether accidental or surgical. The fact that many patients recover following a surgical operation is not proof that the recovery is due to the operation, because many psychoses are self-limiting and recoverable. The surgeon may get credit for curing these psychoses whereas the operation may have really made recovery more difficult.

There is one other etiological factor that must be mentioned, *viz.*, the physiological epochs of life:—puberty, adolescence, childbearing, and the involution. It is at these times that many psychoses become evident. These are times of great stress involving physical changes, nervous disorders, emotional stresses and endocrine imbalance, sometimes, as in the case of childbirth, coupled with exhaustion and infection. To a person burdened with inherited defect and poor training, the tremendous extra load put on him or her at these times may prove to be more than the individual can carry, and the result is a breakdown, either temporary or permanent. Seldom is one factor sufficient to produce a psychosis. More commonly there are several factors combined together breaking down the individual's resistance and forcing him to escape from them in one of the ways mentioned.

These two psychoses dementia præcox and manic depressive psychosis represent two different modes of reacting. Dementia præcox represents a regression, a retreat from the difficulties. The individual finds reality too hard; he gradually cuts himself off from real things and retraces his steps back along the path of biological development until he reaches a state of mind where he can be content, where he has no responsibilities, where he can indulge his fantasies and give himself up to auto-erotic and other childish or infantile pleasures.

The manic-depressive reaction is better than the præcox. In it the chief symptoms are states of excitement and states of depression, both states being frequently found in the same patient at different times. The same etiological factors are present in both psychoses, but here there is no retreat, no quitting. It is true the individual finds life too hard with his limited endowment, he feels that he must get away from it for awhile at least, and in the manic or excited state he seeks to do so by excessive work and talk, he goes rapidly from one thing to another, engaging in all sorts of activity in the attempt to keep his mind off his troubles. This is but an exaggeration of a normal reaction, surely. We frequently speak of an individual trying to forget his trouble by work. In the other phase of this psychosis, there is also an exaggeration of a normal mental reaction, but here the individual is overcome with his troubles and, like some women in distress, relieves his emotional tension by tears. He gives vent to his emotions, is anergic and does not wish to think at all. When the excess emotion is got rid of, he comes back to the battle of life for another attempt to conquer its difficulties and find contentment. This is why this psychosis has such a favourable prognosis; the individual does not quit, he merely temporizes. It may be objected that many cases of dementia præcox also recover, which is perfectly true and fortunately so. The regression in these cases is arrested before it has gone very far, and the individual is once more turned about and headed for reality. This is the object of treatment in this condition; to restore his interest in living and a desire for life.

Every symptom is the symbol or expression of an idea, if we can but interpret it. There are no accidents in the psychic life. Cause and effect bear the same relationship to each other as in any other sphere of activity. But we should remember the symptoms are not what they appear to be, but are disguised so that their true meaning is not usually recognized, even by the patient. The individual who laments that he has ruined the world does not really believe he has ruined the world, but rather he has ruined his life. Bodily delusions and hallucinations have varying significances, frequently having a definite sex value. The fear of being attacked often means the converse as shown by the eagerness with which these individuals would give themselves up to the supposed assailants. Delusions of persecution are usually a compensation for inferiorities, perhaps with a sex value. Delusions of grandeur represent an over-compensation for these inferiorities, the individual identifying himself with real greatness. The grotesque and bizarre conduct of certain patients can often be traced to some occurrence in the

previous life of the patient. The common hallucinations of hearing, usually disagreeable or threatening, come from the individual's dissociated consciousness, and the patient is really reproaching or threatening himself for past misdeeds, or giving voice to his repressed wishes which were not attainable in reality. I can merely indicate the meaning of a few of these individual symptoms. Their practical value is the interpretation, giving us an insight into the patient's secret cravings and desires, and leading us, perhaps, to the emotional stresses that have led to the psychosis. If we can find the actual stresses we surely have a point of attack. Even if we find them we may not know how to handle them, but the better understanding of symptoms and their cause will lead us some day to the era of therapeutic psychiatry, when we will be able to take these stresses and remove or counteract them so that they will cease to exert their crippling influences.

Case 1.—C. R., woman aged fifty, admitted to the Ontario Hospital, London, on September 15, 1924. Pleasant appearing; talks freely and in a normal tone; free from recognized physical disease. She complains that for ten years she has believed that her husband has sought to make her unhappy and ruin her life. She believes that everyone can read her thoughts, that people can see into her room and know everything she does. Her interest in her home has waned, she has become more seclusive, and threatens her husband and family. She appears to be content to remain here, is well conducted, pleasant with other patients, clean, and tidy, although not inclined to take much interest in occupying herself. Does not refer to her delusional ideas unless directly interrogated concerning them. She has shown no improvement in the two years she has been with us, although occasionally inquires if she may go home.

Are we to be satisfied simply with a diagnosis in this case. Call her case one of paranoia, or paranoid dementia præcox, and we have not progressed very far. What caused her psychosis and what does it mean? Her relatives can throw no light on the etiology. They say she just gradually developed these ideas, and they know of no cause.

The symptoms suggested that there was something she didn't want the world at large to know. When asked directly if there were any such facts, she gave the following story after some hesitation: Ten years ago the family came from England, the patient with her husband and three children. They were industrious and conscientious, a good type of citizen, but with little of this world's goods. The husband secured work in a machine shop but three months later his hand was badly injured in a machine, and had to be amputated. As their living depended on the use of his hands this was a severe blow to the economic situation of the family. To make matters worse the patient discovered she was pregnant. Another mouth to feed in addition to the three small children appeared impossible. In this time of stress she resorted to an abortionist much against her better judgment and training and religion, and an abortion was produced. It was not long before her husband secured the position of janitor in a large building, and with her help they once more became free from financial worry. After a short time however her conscience began to worry her. She felt she had done wrong, that she had killed her child; she was tortured; she thought that her husband who had been willing and perhaps urged such a step, was just as much or more to blame than she was. What could have been his motive in causing her so much distress? Surely it must have been that he hated her and wanted to rid himself of her, and this idea has grown during the years. She has thus transferred her guilt, clearing her conscience at the expense of her mental integrity. The prying eyes which watch her all the time may signify the desire that the world may know that her life is now an open book, this one and only blot having been removed, or it may signify that the eye of God or the people is constantly on her as a sort of reproach, and preventive of such things again. This explanation also tells us why she doesn't get better. She cannot bear to be brought face to face with her conscience again. To her it was an unpardonable offense. Her psychosis was developed in self defense and while it is not a perfect state, she at least is contented and her conscience does not bother her.

Case 2.—W. V., woman, aged twenty-six, admitted to the Ontario Hospital, London, on July 17, 1923. Her family tree was not the best, showing several individuals who were eccentric. The patient herself appears to have been a dull normal in intelligence and unstable. There was a short mental illness six years ago. She married a young man of much the same type, who had been attentive to her for several years, but her married life was a constant succession of stresses. Her husband borrowed his mother's wedding ring for their wedding, and of course had to give it back immediately after the ceremony. There was hard work on a poor farm, the property of the husband's father. There were several pregnancies, poor health, and no real affection. The patient wanted to escape from this apparently hopeless and intolerable situation, but how? She told her own mother she would leave him, when the present pregnancy was over, but she had no place to go, and was unable to take her children

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or to leave them. She decided to suicide. Leaving the house early in the morning she went to a stream flowing nearby and jumped in. Her courage failed her, however, and she came out of the water and returned home. After a few days of confusion and dullness, she was sent to the Ontario Hospital, London. A few days later she became absolutely inaccessible, lay in bed oblivious of everything, refused food, saliva dribbled from the corners of her mouth, she gave no attention to the calls of nature. She persisted in this stuporous state for several months. She then gradually became less stuporous, but still dull and indifferent and was taken to her mother's home where the improvement continued.

This psychosis might be called a catatonic stupor, but that is not sufficient. Why did she enter a stupor rather than react some other way? Because the stupor symbolized death. She wanted to get away from an unbearable situation; she lacked the physical courage to suicide, or perhaps she still hoped that happier days might come, so she developed a condition which was a close approach to the inactivity of death, and she remained this way for several months. Her desire for life then became stronger than her desire for death, and she gradually returned to a normal condition ready once more to make another attempt to find contentment.

These are but two cases of the hundreds that come into the mental hospitals of Ontario every year. In many cases the etiological factors are obscure, and the psychosis difficult to interpret, but in all cases the attempt should be made. The old rule in the treatment of pathological conditions, "first remove the cause", is just as applicable in mental disease as in any other disease. These individuals in the early stages of their disorder are seen by the attending physician, when the causes should be closer to the surface, and they still possess a certain amount of critique and perspective; at this time better results would be expected than much later when the pathological way of reacting has become a habit and the individual has become inaccessible.

In this paper I have not attempted to describe early symptoms in any detail because they are multitudinous. The best definition of mental disease "a more or less prolonged departure from the individual's usual manner of thinking, feeling and acting," intimates what these symptoms may be. The symptoms themselves are apparent, but the important point from the standpoint of treatment, and even prevention, is,—"what has caused these symptoms?" An earnest attempt to interpret the symptoms will very often throw light on the etiology, because in the psychosis the individual is striving to get away from an intolerable situation and gain contentment in a world of his own making. Knowing all the etiological factors, we realize that some can be removed or altered, whereas others cannot. By working on those that can be ameliorated, we may lighten the patient's burden sufficiently for him to successfully shoulder the other burdens and again make a fair adaptation to life.

I have attempted to describe the chief etiological factors in these psychoses, and to direct attention to the hidden meanings of the symptoms presented. It is the duty of the medical profession to safeguard the health of our people both physical and mental. The devastation created by these failures at adaptation is a direct challenge to us as physicians to familiarize ourselves with the factors that produce them, so that the old phrase *"mens sana in corpore sano"* may become a reality by means of our efforts.

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The trustees of the recently incorporated Bermuda Biological Station for Research are as follows: E. J. Allen, director, Marine Biological Association, Plymouth, England; J. A. Ashworth, University of Edinburgh; E. G. Conklin, *chairman*, Princeton University; E. V. Cowdry, the Rockefeller Institute for Medical Research; C. B. Davenport, of the Carnegie Institution; B. M. Duggar, Washington University, St. Louis; R. A. Harper, Columbia University; Ross G. Harrison, Yale University; A. G. Huntsman, director of the Atlantic Biological Station, St. Andrews, N.B., Canada; E. L. Mark, Harvard University; E. A. McCallum, director of agriculture, Bermuda, and H. W. Rand, *secretary-treasurer*, Harvard University.

SOME CONTRIBUTIONS TO OUR KNOWLEDGE OF DISEASES OF THE KIDNEY AND LIVER*

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Part II†

Advances in the Diagnosis and Treatment of Diseases of the Liver

OUR ignorance concerning the liver is appalling. There is no other great organ of the body of which we know so little. Among the more important advances affecting our knowledge of the diagnosis and treatment of diseases of the liver should be included the anatomical studies of the vascular and biliary systems, the physiological studies of the liver,[16, 17, 22, 33] the clinical studies involving the functional tests of the liver, the development of cholecystography, the introduction of pre-operative and post-operative care of the jaundiced patient, and finally, the treatment of the associated diseases, ascites and certain forms of toxæmia.

Anatomical and pathological studies. — McIndoe and Counseller have contributed something to our knowledge of the structure of the liver. They have made molds or casts of the vascular and biliary systems by injecting them with colloidin solutions and destroying the rest of the substance by corrosives. Their work has emphasized the bilateral nature of the liver (Fig. 11), the remarkable dilatation of the biliary tree, the hydro-hepatosis resulting from obstruction of the common duct (Figs. 12 and 13), and also the inadequacy of the portal vascular system in cases of portal cirrhosis.

Physiological studies.—Mann and Magath have succeeded in maintaining life in dogs for a period of from thirty-six to forty hours after removal of the liver. In such animals hypoglycæmia develops, associated with convulsions and death unless the blood sugar level is maintained by the administration of glucose. This work is significant in relation to hypoglycæmia in general and suggests the use of glucose in forms of toxæmia associated with hepatic insufficiency. In a dehepatized animal, deamidization is remarkably disturbed and the nitrogen and urea of the blood diminish simultaneously. On the other hand, uric acid accumulates in the blood. There is also retention of serum bilirubin, with an indirect van den Bergh reaction and the development of jaundice. Although these findings are of great scientific interest, the clinical application of the nitrogen studies is not clear since the extensive study of diseases of the liver in the wards almost invariably fails to reveal significant changes in the nitrogen partition of either the blood or the urine.

By spectrophotometric methods, Mann, Sheard, Bollman and Baldes have shown that the blood coming from the spleen (Fig. 14) and bone marrow is richer in serum bilirubin than the blood entering these organs. This is a confirmation of the theory that the serum bilirubin is formed in the organs rich in reticulo-endothelial cells.

The liver is the source of two substances which promise to become important in clinical medicine, namely heparin and the extract of the liver already mentioned as isolated by Canadian investigators. Heparin was isolated by Howell, and is an antiprothrombin which renders the blood temporarily incoagulable, and bids fair to replace many other substances now used for this purpose.

The rôle of functional tests.—Numerous functional tests of the liver have been suggested[23] but the comprehensive study of hundreds of cases and an interest extending over a period of fifteen years convinces me that significant success so far attaches only to the tests of the

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* Abstract of paper read before the Ontario Medical Association, London, Ontario, May, 1926, and before the Canadian Medical Association, Victoria, B.C., June, 1926.

† For Part I, Diseases of the Kidney, see *Can. Med. Ass. Jour.*, Nov., 1926, xvi, 1306.

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excretory function.[3, 11, 30] The following is an outline of the tests that have been found valuable, together with a summary of their significance.

FIG. 11.—Colloidin cast of the portal vein, showing the bilateral distribution of the two branches. Normal arrangement.

FIG. 12.—Colloidin cast of a normal biliary tree.

Important tests of hepatic function are: (1) serum bilirubin (van den Bergh); (2) bile index; (3) dye retention, tetrachlorphthalein or bromsulphthalein;[20, 21] (4) bile salts in blood and urine (?); (5) coagulation time of blood; (6) fragility of corpuscles, and (7) bile and its products in urine, stools and duodenal contents.

The practical values of these tests are as follows: In diagnosis they reveal (1) whether or not the liver is diseased; (2) whether or not there is jaundice and its nature, obstructive or hæmolytic, and whether the terminal picture is common to several pathological processes, and (3) the classification of hepatic diseases. In prognosis these tests aid in determining the degree of hepatic insufficiency, but this is of slight value in foretelling the course of the disease.

In treatment the tests reveal (1) therapeutic indications; (2) favourable time for operations, especially when jaundice is present, and (3) indications for individualization in treatment.

The bile index is important in jaundice, but is non-specific. Our test with phenoltetra-

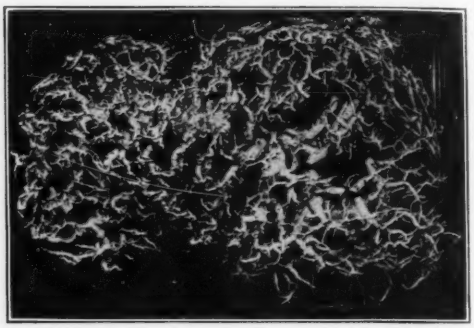

FIG. 13.—Dilated biliary tree; hydrohepatosis resulting from obstruction of the common duct.

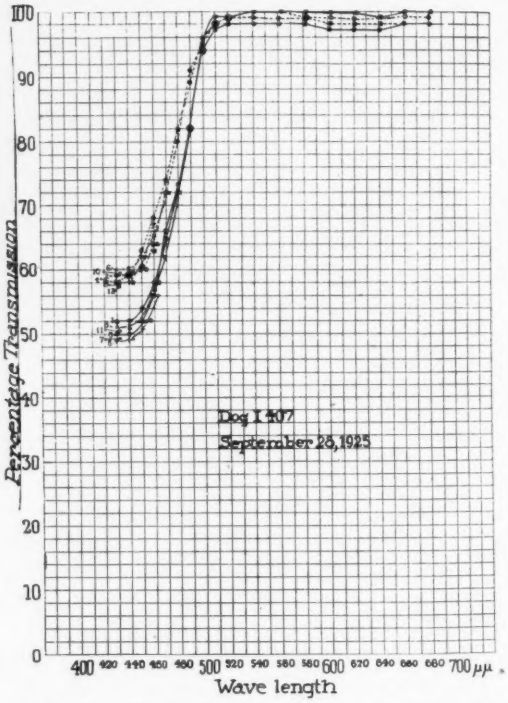

FIG. 14.—Effect of the injection of red cells on the concentration of bilirubin. Curves 1, 3, 5, 7, 9, and 11 show transmission of light through plasma taken from the splenic vein at thirty-minute intervals. Curves 2, 4, 6, 8, 10 and 12 are for blood from femoral artery at thirty-minute intervals. Immediately after withdrawal of blood for curves 2 and 4, washed red cells in 5 c.c. of physiologic solution of sodium chlorid was injected into the splenic artery. The bilirubin concentration in the splenic vein is consistently greater than in the arterial blood and not affected by the injection of red cells.

chlorphthalein, particularly as modified by Rosenthal, is of great service especially if there is no jaundice. The method of van den Bergh specifically and quantitatively determines serum bilirubin and differentiates two forms, one yielding a direct and the other an indirect reaction, related respectively to obstructive and hæmolytic types of jaundice. This throws considerable light on diagnosis in hepatic disease, especially in the presence of jaundice. The coagulation time of the blood is of unusual significance particularly in relation to the surgical risk, since hæmorrhage in profound jaundice is frequent during or following operation. This may be corrected by pre-operative management. The increased fragility encountered in hæmolytic jaundice makes its recognition much easier.

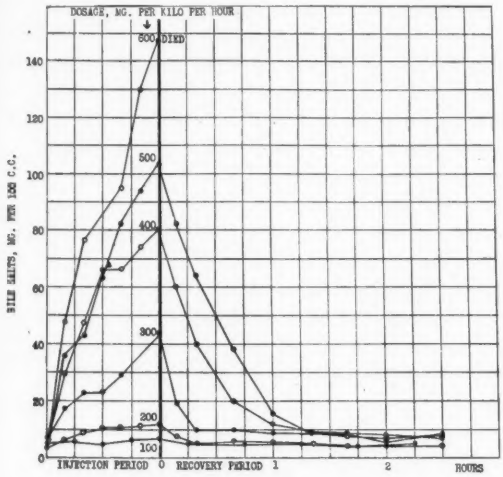

FIG. 15.—Behaviour of bile salts in the blood following their intravenous injection.

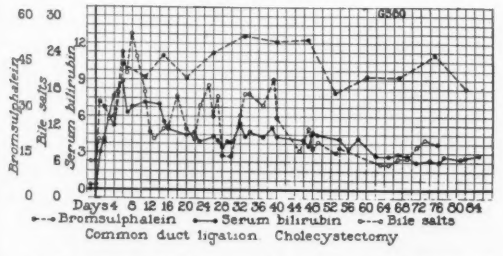

FIG. 16.—Behaviour of bile salts, serum bilirubin, and dye retention in the blood following ligation of the common duct and cholecystectomy.

The problem with regard to bile salts is far from solved. The finding of bile salts in the blood in several hundred patients in our wards indicates, however, that dissociated jaundice does occur, as has been held for years by French investigators. The method employed is a modified and standardized Pettenkoffer test, developed in our laboratories.[1] Although still imperfect, it serves to indicate adequately relative changes in the bile salts of the blood. Figures 15 and 16[24] illustrate the behaviour of bile salts in the blood following ligation of the common bile duct and intravenous injection of the salts respectively. Increases in bile salts usually occur in the blood in the early stage of jaundice and frequently in cirrhosis of the liver, prior to the onset of collateral circulation, ascites and jaundice.

Daily contact with diseases of the liver and group investigations of the problems presented convince me that these various tests are of considerable practical importance in diagnosis and treatment. Their greatest service thus far, however, has been in the centreing of interest on diseases of the liver with the result that we are beginning to appreciate our shortcomings in this field.

Cholecystography. — Graham and Cole, by means of a phthalein opaque to the Roentgen ray, have developed a visual method of studying the gallbladder in health and disease. This is a contribution of great practical importance. By its aid Graham claims an accuracy in the diagnosis of disease of the gallbladder of more than 95 per cent, while Carman, in a series of 737 cases coming to operation reported a correct diagnosis in more than 76 per cent.

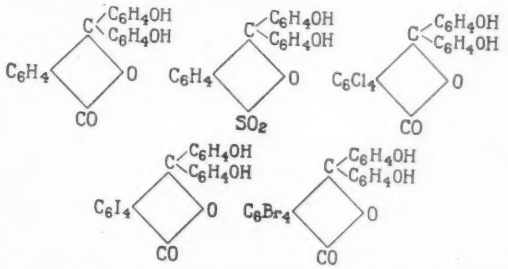

FIG. 17.—Chemical relationship of various types of phthalein.

The part dyes play in diagnosis of diseases of the kidney and liver is unusually interesting. Fig. 17 reveals the close chemical relationship of various types of phthalein used in this connection: (1) phenolphthalein, (2) sulphonephthalein, and (3) tetrachlorphthalein (a test

of hepatic function), also (4) tetra-iodophthalein, and (5) tetrabromphthalein used in cholecystography.

Difficulties of diagnosis in diseases of the liver.—Extensive study and observation of diseases of the liver, impress me with our extreme limitations in the differentiation of various types of jaundice and cirrhosis. The greater our familiarity with the subject the more impressive are these limitations. Mixed types of cirrhosis are common. Fig. 18 represents the striking collateral circulation and ascites developing in a dog about three or four months after ligation of the common bile duct.[24] Obviously, portal cirrhosis as well as biliary cirrhosis may be present.

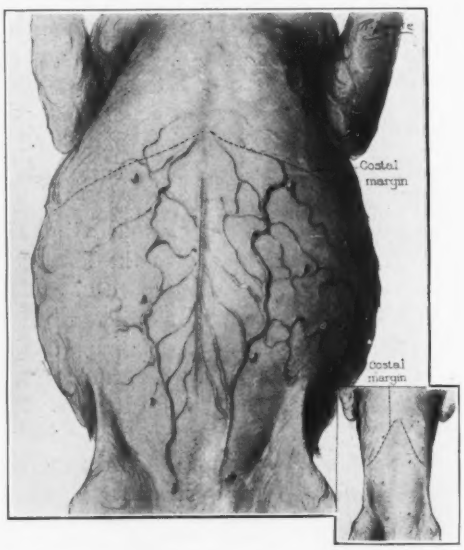

FIG. 18.—Collateral circulation and ascites in a dog following ligation of the common duct.

Treatment of diseases of the liver.—A wider understanding of the liver and its diseases should result in more effective treatment. It should affect the principle of medical management, increase the capacity to determine the surgical risk and improve surgical judgment and surgical results. Progress is already evident in several connections. Factors relating to the prevention and treatment, some of which have not received the consideration they deserve, are as follows:

Prevention: (1) care of acute infectious and chronic foci, especially intra-abdominal foci; (2) care relative to alcoholic condiments, chloroform, arsenic, phosphorus, copper, phenylhydrazin, and tar, and (3) care in industry with phosphorus, "aeroplane dope," and picric acid.

Treatment: A, specific: (1) use of constitutional specifies: arsphenamin, iodide, mercury, emetin, quinin, vermicides, and (2) hepatic specifics: water, glucose, and calcium.

B, functional: (1) relief of biliary obstruction by transduodenal drainage; (2) relief of ascites and portal obstruction by surgical treatment (the Talma-Morrison operation, splenectomy, or paracentesis), or by medical treatment (novasurol, ammonium salts, or restriction of salt and water); (3) relief of hæmolysis by splenectomy; (4) relief of congestion by digitalis, diuretics, restriction of salt and water, and (5) protection from hæmorrhage in jaundice by calcium, transfusion, carbohydrates and water.

C, symptomatic: (1) relief of pruritus by calomel, emetin, diathermy and sweating; and (2) relief of gastro-intestinal disturbances by diet and sedatives.

Pre-operative preparation of the jaundiced patient.—By the intravenous administration of calcium salts or transfusion, the use of a high carbohydrate diet, and the intake of large amounts of water (3000 c.c. daily) and the determination of the coagulation time (Lee and White method) of the blood can be controlled before surgical intervention, and thus the risk of post-operative hæmorrhage in jaundiced patients has been greatly reduced. Walters has shown that whereas previously the post-operative mortality among jaundiced patients was high in 1924, there were but four instances of hæmorrhage following 142 operations on the common or hepatic ducts in the Mayo Clinic. Besides preventing hæmorrhage this method of preparation also enables the surgeon to select the most favorable time for operation. Patients with a constant or decreasing level of serum bilirubin offer less surgical risk than those whose serum bilirubin is mounting.

The treatment of toxæmia associated with hepatic insufficiency.—The administration of large quantities of glucose solution is of value in the treatment of post-operative toxæmia, particularly if the biliary channel is being drained. In such cases there may be high blood urea (Fig. 19)[12] and failure of both urinary and biliary ex-

cretion, together with malaise, nausea, vomiting, and coma. In certain cases all of these disturbances may quickly subside under the administration of water, and glucose or salt. This type of toxæmia is probably analogous to that seen after sudden drainage of the distended urinary bladder. It would appear, therefore, that gradual relief of the distended biliary system, if possible, is also indicated.

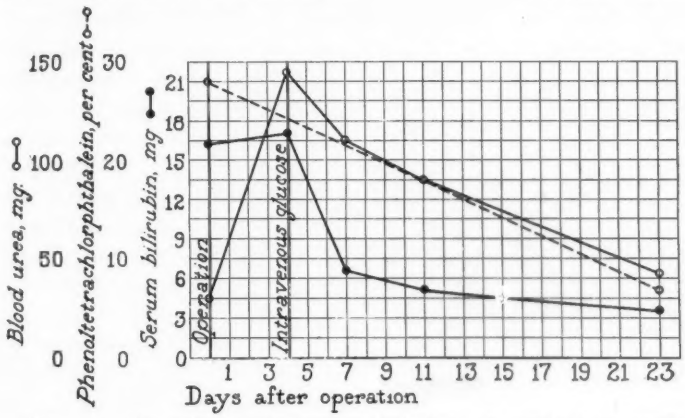

FIG. 19.—The effect of intravenous injection of glucose on the blood urea, dye retention and serum bilirubin following operation.

Treatment of pruritus.—The control of pruritus may seem a small matter but often it constitutes the most difficult problem in the management of diseases of the liver. In fact, it may be one of the outstanding complaints. Obviously, the re-establishment of the circulation of bile is the objective. However, this is often impossible, and symptomatic management is urgently demanded. Courses of calomel over a period of a few days often bring marked relief, which may last for weeks. Emetin also has appeared to be of value in some cases. Sweating may help and diathermy not infrequently acts almost as a specific.

Treatment of ascites.—Perhaps the greatest advances in treatment are in connection with the management of ascites in disease of the liver. Whereas, formerly, tapping was usually resorted to, it is now apparent that in a considerable proportion of cases the ascites yields to novasurol. When this is administered intravenously in doses of 2 c.c. every four or five days it usually produces marked diuresis for one or two days.[25] Fig. 20 indicates the results in a case of portal cirrhosis. The effect of novasurol is enhanced considerably by the simultaneous use of ammonium chloride or nitrate in doses up to 9 gm. daily. The medical control of ascites is unquestionably an important consideration in the treatment of cirrhosis of the liver.

In relation to the diseases of the liver it would seem that the profession has been "at ease in Zion," and in need of some great revival. Text-book has continued to copy text-book, and baseless treatment has often been superimposed on meaningless diagnoses. The surgeon, to be sure, has wrestled with the problems of the gall bladder and of gallstones and with jaundice, but the internist has remained largely in ignorance and in bliss in most matters pertaining to the liver. In recent years the liver has not been in vogue. Few physicians have been seriously interested in it or its diseases.

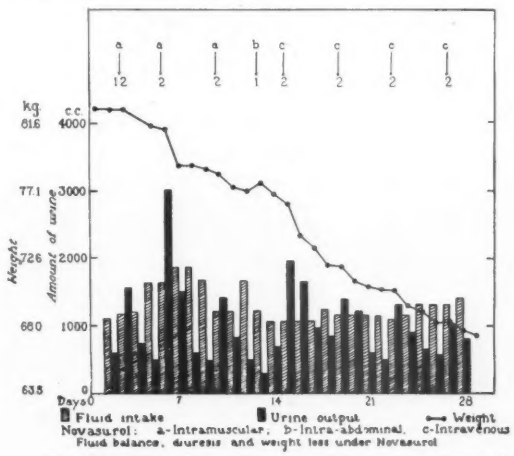

FIG. 20.—The effect of novasurol in a case of portal cirrhosis.

The situation concerning the liver is at present comparable in many ways with that of the kidney fifteen years ago. We are now entering an era of the study of hepatic function as we were then beginning the study of the kidney. I believe, however, that we were better equipped fundamentally concerning the physiology and pathology of the kidney and clinically, concerning the diagnosis and treatment of its diseases than we are at present in similar

CHANGES IN THE BLOOD IN A CASE OF DUODENAL INTOXICATION FOLLOWING GASTRO-ENTEROSTOMY

1923	Serum, mg. for each 100 c.c.					Plasma, mg. for each 100 c.c.		Blood urea	Intake		
	Sodium	Potassium	Calcium	Magnesium	Phosphorus	Chlorine			Sodium chloride gm.	Water c.c.	Urine c.c.
Normal	335	20.5	10.5	2.0	2 to 3	585	65	25			
11–11	336					271	109	282	12.6	3800	Anuria*
11–12	336	15.8	8.0	3.7		350	86	316	20.3	4400	700
11–13	304	13.0	8.4	2.8	9.0	384	77	297		2400	1970
11–14						420	70	288	10.0	3125	2200
11–15									6.5	3000	2500
11–16						485	66	190	12.0	2500	2840
11–17									8.0	3510	3245
11–18									10.0	3580	2990
11–19	350	13.6	9.3	2.7		570	52	86	10.0	3840	3370
11–20									3.0	3540	3570
11–21	371	16.3	9.2	2.6		615	50	54			3000
11–22											2900
11–23											2600
11–24											2200
11–25											
11–26	368	16.5	9.1	2.7	2.1	605	55	27			

*Emesis 1560

matters pertaining to the liver. Moreover, the earliest efforts in determining the functional capacity of the kidney yielded methods of greater clinical value, especially in relation to prognosis and treatment, than any test devised thus far in the study of the liver. Perhaps the greatest value thus far derived from the work on the liver has been the revelation of the magnitude of our ignorance concerning it and the stimulation of our interest in its clinical and laboratory study.

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IODIZED OIL WITH REFERENCE TO BRONCHIECTASIS

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THE endobronchial injection of iodized oil is a valuable aid in the Roentgenographic diagnosis of bronchiectasis. We believe this procedure has a therapeutic value also in certain cases of this disease. The twofold object of this article is to discuss one particular method of injection—the supra-glottic—and to present several case reports with reference to its therapeutic use in bronchiectasis. Since October, 1924, the members of our department, under the direction of Dr. Stuart Pritchard have made over eight hundred endobronchial injections of iodized oil. The patients treated are one hundred and fifty in number and have been placed in three groups for the purpose of this article.

In the first group the oil was used as a radiologic aid to diagnosis in those borderline cases having persistent cough with little or no expectoration. In addition, these patients exhibited various combinations of such conditions as anæmia, loss of weight or endurance, and intermittent periods of slight fever. In some patients a chronic focal infection was found in the upper respiratory tract. In others the history of onset led back to an attack of influenza, bronchopneumonia, or acute bronchitis. In some cases of this description the endobronchial injection of iodized oil enabled us to demonstrate a small bronchiectasis in or near the hilum. In others slight cylindrical dilatations were found in the descending bronchi.

The second group comprised those patients in whom the history, symptoms, physical examination and sometimes the Roentgenographic examination indicated bronchiectasis. Here, the injections were given in order to confirm the diagnosis and delineate the extent and exact site of the bronchial dilatations.

The third group is derived from patients in the first two and comprises thirteen cases of bronchiectasis receiving serial endobronchial injections of iodized oil as treatment. With reference to these patients, in addition to many in the other groups, we have records of history, laboratory findings, physical examinations and roentgenographic films made before and after injection. In no instance was this treatment given to a patient under suspicion of having pulmonary tuberculosis.

The diagnostic value of endobronchial injection of iodized oil lies in its fluidity, its opacity to Roentgen rays, its tolerance by the bronchial mucous membrane and its comparative ease of administration.

What we believe to be its therapeutic value may be due to the fact that the oil can be applied directly to the diseased bronchial area where it slowly gives up its iodine. We have confirmed Forestier's statement by detecting small quantities of combined iodine in the urine of patients up to eight days after the endobronchial injection of 10 c.c. of oil. We have never found albuminuria or other evidence of renal irritation. Iodism occurred in three patients known to have swallowed the oil. In each instance there was a bright red rash with itching of the skin. Other patients known to have swallowed oil failed to show these symptoms. In no instance have we observed symptoms of bronchial irritation other than cough with expectoration of oil during a few hours following injection.

Method of injection.—We use the supra-glottic method. The oil is injected into the glottic opening by means of a special laryngeal syringe. (Fig. 1). It is our method of choice for the following reasons: (1) It is simple for the patient and for the operator. (2) It is a brief procedure. (3) It answers the requirements of both diagnosis and treatment in most cases of bronchiectasis. (4) It requires the use of only a small quantity of local anæsthetic.

The following is a description of the supra-glottic method reduced to its simplest form. The patient, seated, and facing a good light, opens his mouth widely and breathes steadily and slightly deeper than usual. The operator places the tip of an oil-filled laryngeal syringe over the

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patient's open glottis and injects 15 c.c. of oil in thirty seconds. This simplicity of procedure requires experience on the part of the operator and usually on the side of the patient. Occasionally we have been able to make an initial injection in this manner.

FIG. 1.—Injection by the supra-glottic method.

Our routine procedure is to anæsthetize the patient's soft palate and posterior tongue by swabbing with a 5 per cent solution of butyn or 10 per cent cocaine. Next, a small syringe is used to drop one to three c.c. of a two per cent butyn solution into the larynx. This is best done with the aid of a headlight and laryngeal mirror. In five minutes or less, the laryngeal and tracheal cough reflex should be reduced sufficiently to allow the injection of oil. A special twenty c.c. laryngeal syringe is ready, filled with slightly warmed iodized oil. The patient, facing the operator, is seated in the desired position. He is instructed to hold his tongue forward and breathe steadily but slightly deeper than usual. Now, with the aid of headlight and laryngeal mirror, the operator holds the tip of the laryngeal syringe over the glottic opening and slowly and steadily injects the oil into the trachea.

Comment.—On completion of injection it is advisable to have the patient continue holding his tongue and breathing steadily for half a minute; otherwise there may be rejection of the last portion of oil. If there are immediate signs of returning cough reflex, films should be made at once. Usually the patient may first be observed fluoroscopically to see that the oil is satisfactorily placed. After diagnostic injections our procedure is to make lateral and antero-posterior films in the upright position. With some patients of experience the operator can dispense with the laryngeal mirror and even the local anæsthesia. With patients exhibiting much expectoration a preliminary endobronchial injection of four c.c. of 2 per cent menthol in hydrocarbon oil serves to empty the bronchiectases. Fifteen c.c. of iodized oil is usually sufficient for visualizing the lower bronchi of one lung. We do not employ this procedure in conditions such as acute pulmonary disease, active pulmonary tuberculosis, cardiac decompensation, or in cachexia.

Position of patient.—This iodized oil has a specific gravity of 1350. It is readily subject to the laws of gravity and its deposition can be controlled largely by the position of the patient during the injection. Since 90 per cent of all bronchiectases are situated at or below the level of the hilum, we make our initial diagnostic injection with the patient seated. The force of gravity aided by the aspirating power of the lung will draw the oil to these levels. For the filling of bronchi on the right side the patient's trunk should be inclined to the right. An inclination forward or backward will serve to place the oil in the anterior or posterior branches as desired.

For injection of the middle and ascending bronchi the patient should be placed on a tilting table with the desired side downward. The head and neck supported by pillows should be in a nearly upright position. Immediately after the injection of twenty or thirty c.c. of oil the patient is tilted head downward for a minute. This position provides a flow of oil into the ascending bronchi.

Therapeutic use of iodized oil.—The endobronchial injection of iodized oil as a therapeutic measure in bronchiectasis was suggested to us by the earlier use of solutions of menthol in hydrocarbon oil. Symptomatic improvement following this method of treatment has been reported by Armand-Delille and Nicaud and Dollfuss. Our procedure is simply to fill the bronchiectases with iodized oil by the supra-glottic method. The interval between injections is governed by the quantity of oil required. We

use from 5 to 20 c.c. at intervals of from five to fourteen days. The duration of treatment has depended upon the tenacity of the patient's symptoms. Since October, 1924, we have treated thirteen cases of bronchiectasis in our department. The improved condition of these patients following treatment has led to the publication of this article. The following case histories are submitted.

Case 1.—M. S., age twenty-seven, had persistent paroxysmal cough following measles and bronchitis eight months previously. Daily expectoration of about thirty c.c. of greenish sputum recently become offensive. Loss of weight, weakness, pallor and dyspnœa on exertion. No known rise of temperature. Auscultation revealed rhonchi and coarse râles at the left pulmonary base posteriorly. Ordinary films failed to show any shadows suggestive of tuberculosis, pulmonary abscess or bronchiectasis. Films after injection contained shadows characteristic of bronchial dilatations in the base of the left lung. No acid fast bacilli found in sputum on repeated examinations. This patient has received eight injections of fifteen c.c. of iodized oil to date and treatment is being continued. Patient reports a fifty per cent reduction in quantity of sputum and the entire absence of cough during the past three weeks. General health greatly improved.

Case 2.—N. P., age twenty six, troublesome cough and daily expectoration of approximately thirty c.c. fetid green sputum for past three years. No acid fast bacilli found by staining or guinea-pig inoculation.

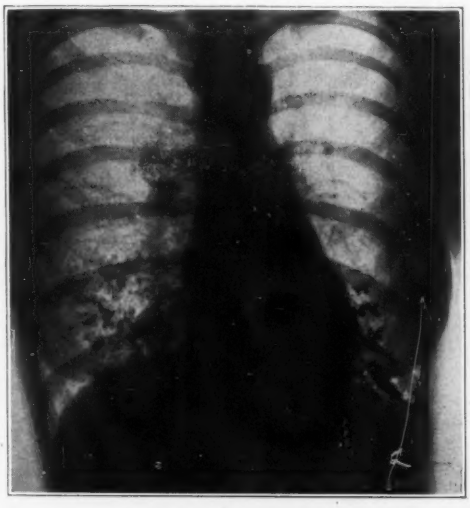

FIG. 2.—*Case 1.*—Diagnostic injection showing bronchiectases in base of left lung.

FIG. 3.—*Case 2.*—Film made before diagnostic injection.

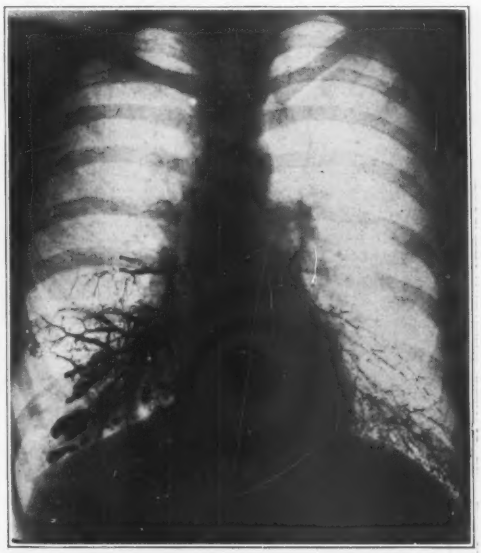

FIG. 4.—*Case 2.*—After diagnostic injection. Saccular bronchiectases in right base.

FIG. 5.—*Case 4.*—Film made before diagnostic injection.

Temperature normal. Nutrition and general health good. Fingers not clubbed. History of pneumonia five and four years previously. Tonsillectomy one year after onset failed to relieve cough. Physical examination of chest revealed a few rhonchi at right base posteriorly. Ordinary films showed coalescing densities at the base of the right lung field. A diagnostic injection of oil revealed clear-cut saccular bronchiectases at the right base (see Fig. 7). This area received five therapeutic injections of fifteen c.c. of iodized oil at weekly intervals. The patient was then treated by his home physician. After the fifth treatment his cough was negligible and his sputum was reduced in daily quantity and offensiveness.

Case 3.—M. C., age thirty-six, persistent cough for past eight years following influenza. Scant daily sputum revealing no acid fast bacilli. Pale, nervous, easily fatigued. Intermittent slight elevations of temperature. Dull pain underneath sternum. Auscultation revealed rhonchi over right lung root zone posteriorly. Ordinary films negative. After diagnostic injection of iodized oil the films revealed a small bronchiectatic pocket in the right lung root. This area received an injection of ten c.c. of oil weekly during a period of six weeks. For a year this patient has been without cough or expectoration and has felt well.

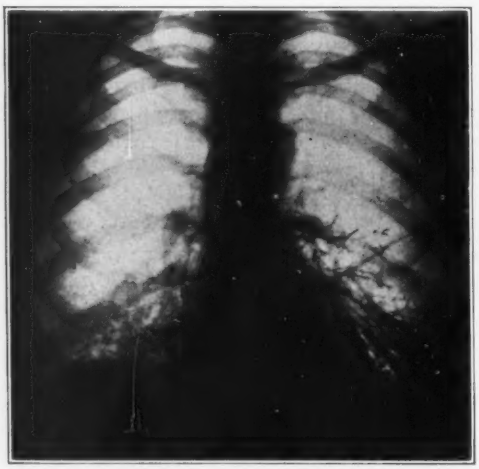

FIG. 6.—*Case 4.*—Cylindrical bronchiectases in left base revealed by diagnostic injection.

Case 4.—Mrs. P., age thirty-six, persistent cough for past eighteen years dating from measles with acute bronchitis. During past four years there was daily expectoration of two to three ounces of purulent offensive sputum. No tubercle bacilli found on several examinations and on guinea pig inoculation. Temperature to 100° F. at irregular intervals. Nutrition good. Fingers clubbed. Scattered rhonchi chiefly left base. Ordinary films negative. Examination of nose and throat negative. After diagnostic injection of oil the films showed cylindrical bronchiectases at base of left lung (see Fig. 2). After receiving sixteen therapeutic injections of ten c.c. iodized oil over a period of eleven weeks the patient's sputum became mucopurulent and inoffensive. Four months later without further injections patient reported a fifty per cent reduction in cough and expectoration. Twelve months after beginning treatment a further improvement was reported and a diagnostic injection of oil revealed a slight but definite narrowing of the cylindrical bronchiectases.

Case 5.—C. L., age thirty-five. This patient had a troublesome spasmodic cough persisting since a pneumonia of infancy. At the time of our examination her daily expectoration amounted to four ounces of yellow offensive sputum. Repeated examinations had failed to reveal acid fast bacilli. Nutrition was good but weakness and dyspnœa were evident. Finger clubbing was present. There was a history of occasional blood streaked sputum and of occasional rises of temperature to 100° F.

FIG. 7.—*Case 5.*—Lateral film showing saccular bronchiectases.

Auscultation revealed rhonchi in both lungs and persistent râles localized over the base of the right lung posteriorly. Ordinary chest films showed an irregular shadow at the right pulmonary base. The injection of fifteen c.c. of oil into this region revealed several saccular bronchietases. An injection of the left base revealed two small bronchial dilatations. This patient now undergoing treatment has received eight therapeutic injections of fifteen c.c. of iodized oil at ten day intervals. At the time of her last treatment she reported her cough as being reduced by one-third and rarely spasmodic. There is a corresponding reduction in the quantity of sputum and a considerable improvement in general health.

The latest monument in the evolution of man, the Neanderthaloid skull found at Gibraltar a few weeks ago by Miss Daisy E. Garrod, of Oxford University, was exhibited to the assembled scientists. The shattered bones, together with rude stone implements of Mousterian type, were dug up at a depth of ten feet. They are now under examination in an effort to trace the path of migration.

HÆMOLYTIC INFLUENZA BACILLI IN ACUTE RESPIRATORY INFECTION*

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Introduction.—The following article is a report of a study of throat cultures from forty-five persons during a fairly wide-spread epidemic of acute respiratory infection, which occurred in the city of London, Ontario, and surrounding district during the winter and spring of 1925. Particular attention is paid to hæmolytic influenza bacilli.

Beginning in the latter part of February, the epidemic reached its height about the second week in March, and had largely disappeared by the first week in April. Clinically, the cases were characterized by a sudden onset with more or less chilly sensations, sore-throat and malaise. After twenty-four to forty-eight hours there occurred a progressive attack on the mucous membranes of the respiratory tract, especially the upper, while in the more severe cases there was some laryngitis and bronchitis. The typical cases were accompanied by frequent paroxysms of sneezing and profuse serous nasal discharge, lasting from twelve to twenty-four hours. There was little tendency for the nasal discharge to become purulent, while in those cases in which the infection descended, the bronchitis was accompanied by rather scanty, mucoid sputum, and very persistent cough. These cases also lasted longer, the cough continuing for three or four weeks. On the whole the infection was rather mild, few of the patients being confined to bed more than from a half to one or two days, while in the milder cases, they kept about their work. Nearly all the patients believed that the infection was not an ordinary "sore-throat" or "cold". There was little fever and very little general aching such as occurs in hæmolytic streptococcus infections. In practically all the cases the pillars and tonsils presented a dusky red appearance without any visible exudate, and accompanying the stage of coryza, there was more or less of a feeling of pressure over the maxillary and frontal sinuses, but very little headache. There was only slight enlargement of the cervical lymph glands. None of the cases studied were accompanied by pneumonia or other serious complication.

Material and methods.—The cases examined were mainly medical students. Others were patients in the city, while a few were from neighbouring towns. Several cultures were obtained at the height of the coryza, others some time after convalescence had begun. A number of contacts, who at no time developed the infection, were also examined. These cases were nearly all recultured one or two to three weeks after their primary cultures, in March and April, and most of them again in May and some again in June. Unfortunately no cultures were studied before the epidemic began.

Swabs from both tonsillar regions were taken in the ordinary manner and fresh blood agar plates inoculated in such a way as to give a good spread of colonies. The plates were made with 5 per cent sterile defibrinated rabbit blood and ordinary meat infusion agar p.H. 7.5. Other plates were also made in exactly the same manner, except that 5 per cent sterile defibrinated sheep blood was used. These plates were used at the same time as the rabbit blood agar plates, so that two plates were used for each culture, one of sheep and one of rabbit blood. The swab was rubbed over the surface of the first plate, then rotated and the opposite side used for the second. This was to give an exactly similar inoculation on each plate.

For a time duplicate inoculations on Avery's sodium oleate agar were made, to search also for Pfeiffer's non-hæmolytic bacillus, as well as to study the growth of hæmolytic influenza

* A thesis submitted in partial fulfillment of M.Sc. degree.

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bacilli on this medium. These plates were made with both rabbit and sheep bloods.

In several of the early cases, sputum and nasopharyngeal cultures were made at the time of throat cultures, but owing to the fact that these all showed fewer influenza colonies, and since the affection was particularly marked in the oro-pharynx, subsequent cultures were made only from the tonsillar regions.

In most of the cases a colony of the predominant green-producing organism present was fished for identification and classification. Hæmolytic influenza bacilli were fished for study of morphology, staining, growth requirements, cultural characteristics, and agglutination reactions. Reduction of nitrates was determined, using potassium nitrate broth with blood extract[25] and later, brewer's yeast,[22] as an enriching substance, with the sulphanilic acid and naphthylamine reagent. Indol production was tested by Ehrlich's method, using Dunham's peptone enriched as above. Specific agglutinations with rabbit immune sera were tried with twenty-seven of the strains (see table I). The sera were prepared by injecting rabbits intravenously with live cultures of four different strains of hæmolytic bacilli.

Fermentation tests were made with meat infusion sugar-free broth and also Dunham's peptone, plus 1 per cent carbohydrate and enriched as above.

Observations and results. (a) *Green-producers and other members of throat flora.*— Colonies of organisms which produced green discolouration on blood agar were present in every culture, as one would expect. In forty-two out of forty-eight cultures, the predominant green-producer was found to be a streptococcus viridans. Of the remaining six, five were group IV, and one, group II A pneumococci.

Of these forty-two strains of streptococcus viridans, nineteen fell into the subgroup Salivarius, 1; (Brown[3]), fermenting lactose and saccharose but not mannite, salicin, raffinose or inulin. The other twenty-three belonged to subgroup Salivarius, 2; fermenting lactose, saccharose and raffinose but not mannite, salicin or inulin. Later throat cultures, made in the different cases, showed no essential change in the green producing flora.

The Gram negative cocci, which, along with the green-producing streptococci, largely form the permanent throat flora, were present in varying numbers in every culture. *Micrococcus catarrhalis* and *Micrococcus pharyngis siccus* were present in greater numbers than other members of the Gram negative group. Some of the strains of *M. pharyngis siccus* produced slight hæmolysis on blood agar. In two cases with bronchitis and persistent cough, sputum cultures showed many *M. pharyngis siccus* colonies with a narrow rather ill-defined zone of hæmolysis about them. These strains grew quite well on plain meat infusion agar and fermented dextrose, saccharose and maltose but not lactose. No reference could be found in the literature regarding this characteristic of *M. pharyngis siccus*, although Clark and Felton[4] have reported a hæmolytic *M. catarrhalis*.

Other organisms, such as *staphylococci, M. tetragenus, diphtheroids,* etc., were present in various cultures but like the Gram negative cocci showed no regularity in their presence. Bloomfield[1] considers these organisms, with the possible exception of diphtheroids, as transient members of the throat flora.

The hæmolytic streptococci encountered, fell into several different subgroups, chiefly *pyogenes, angiosus,* and *infrequens,* (Brown's Classification[3]).

Non-hæmolytic influenza bacilli were not encountered in these cultures. This may be accounted for in part at least by the fact that these organisms have become progressively less prevalent each year since the last pandemic of influenza in 1918. In the years immediately following the latter, they were very prevalent in throat cultures generally, as reported by Stillman,[19] McLeod, Ritchie and Dottridge,[12] Pritchett and Stillman,[16] Winchell, and Stillman,[24] and others, although different figures are reported from different centres. This may be partly explainable on the basis of technique and partly on locality.

Also, the marked difference in green production by *S. viridans,* on the two kinds of blood plates, is worthy of notice. Most of these organisms ordinarily produce readily noticeable greenish discolouration about the colonies on meat infusion sheep blood agar plates. There was distinctly less in all cases and in some little or no green production on the rabbit blood plates, so much so that meat infusion rabbit blood agar would seem quite unsatisfactory for

(c) Agglutination Reactions with Hæmolytic Influenza Bacilli

TABLE I.—SPECIFIC AGGLUTINATIONS WITH RABBIT IMMUNE SERA

	Strain	Sera Immune to Strain			
		L.S. 2	*C.S.S. 1*	*J.H.H. 1*	*G.R.C. 1*
1	L.S. 2	1–2560	–	–	–
2	R.T.D. 4	–	–	–	–
3	C.S.S. 1	1–160	1–10,000	–	–
4	N.B.L. 8	–	–	1–160	–
5	S.B.F. 1	–	1–160	–	–
6	W.C.S. 5	1–40	–	–	–
7	N.L. 6	–	–	1–40	–
8	L.S.M. 1	–	–	–	–
9	N.T.W. 4	1–320	1–80	–	–
10	E.N.B. 1	–	–	–	–
11	G.W.H. 4	–	–	–	–
12	W.G.C. 1	–	–	1–320	–
13	H.R.S. 1	1–160	–	–	1–320
14	J.W.M. 1	1–20	–	–	–
15	H.C.M. 1	–	–	0	–
16	H.S. 1	–	–	–	–
17	E.R.L. 1	–	1–40	–	–
18	W.E.L. 1	1–80	–	–	1–80
19	J.H.H. 1	–	–	1–10,000	–
20	J.L.C. 5	–	1–40	–	0
21	G.R.C. 1	–	1–40	1–160	1–5120
22	G.W.R. 1	0	–	–	0
23	R.R. 7	–	–	–	0
24	V.G.G. 3	0	–	–	0
25	M.T. 3	–	–	–	0
26	H.E.M. 1	0	–	–	–
27	V.G.G. 4	1–20	–	–	–

– =no agglutination
0 =reaction not tested

the identification of *S. viridans* on the basis of green production. Undoubtedly if rabbit blood agar is used for this purpose, many weak green producers would be classified as inactive.

(b) *Hæmolytic influenza bacilli—cultural and morphological notes.*—The most noticeable feature in this series of cases was that cultures taken at the height of the typical attacks, showed hæmolytic influenza bacillus colonies predominant on rabbit blood agar plates, whereas they were not present at all on sheep blood agar plates, or if any were present, the growth was so poor as to be easily overlooked.

Smears stained by Gram's method from many of the strains of hæmolytic influenza bacilli isolated early in this study, showed ex-

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treme thread formation. In some smears few distinct bacilli could be found, just tangled masses of threads being present. These strains, however, took on the ordinary characteristic morphology after a few subcultures. All strains readily decolourized when stained by Gram's method and took the counter-stain readily. There were some strains that showed less marked hæmolysis than others, W.C.S.6 being one of these. These were all isolated late in the series, when the epidemic had subsided. Those obtained from the severe cases always showed marked hæmolysis. Jordan[9] has noted this variation in hæmolysis.

These organisms were nearly all extremely susceptible to drying and variations in temperature except one strain (C.S.S.1) isolated from a normal contact. This strain on its second subculture remained alive for thirty-one days in the incubator at 37.5 C.

Rivers[18] has shown that *B. influenzæ* grows better on rabbit blood and cat blood than on human blood agar, and that obligate symbiosis occurs more commonly on human blood agar than on rabbit or cat blood agar. Symbiosis did not seem to be exhibited by these strains of hæmolytic influenza bacilli on rabbit blood agar, but was on sheep blood agar.

In order to determine whether hæmolytic influenza bacilli would grow on meat infusion sheep blood agar, plates were streaked out heavily with growth from rabbit blood agar slants, and incubated. It was found that minute colonies with weak hæmolysis grew where the inoculation was heavy, but a spread of colonies could not be obtained.

To determine whether growth was due to carrying over some enriching substance from the rabbit blood agar, subculture plates were made with a loop needle from the growth on the first sheep blood plate. This yielded a still poorer growth and after one or two further similar subcultures, no growth was obtained.

The possibility of some inhibiting substance in the sheep serum was eliminated by washing the sheep cells free of serum with saline and then preparing blood agar plates from the washed cells. No difference from unwashed blood cells could be determined. The probability is therefore that failure of growth on sheep blood is due to lack of the necessary enriching substance in the blood cells, rather than inhibiting substances in the serum.

Good growth was obtained in broth tubes to which was added a small piece of sterile potato, after the method of Thjotta and Avery.[21] Brewer's yeast extract, as used by Thjotta and Avery[22] also proved suitable as an enriching substance.

Thirty-seven different strains of hæmolytic influenza bacilli were tested for nitrate reduction. All readily reduced nitrates to nitrites. These same strains always failed to produce indol by the methods used as above.

(d) Incidence of Hæmolytic Influenza Bacilli

TABLE II.—Influenza Bacilli in Throat Cultures

	Patients	*Contacts*			*Total*
		*Chronic Respiratory Cases**	*Acute Respiratory Cases*	*Never having symptoms*	
Cases cultured	27	15	1 (acute laryngitis)	2	45
Cases with H.I.B. predominant	11	0	0	0	11
Cases cultured at height of infection with H.I.B. predominant	6	–	–	–	6
Other cases cultured within a week of onset, with H.I.B. predominant	5	–	–	–	5
Cases with H.I.B. present at some time	27	11	1	2	41
Those never showing H.I.B.	0	4	0	0	4

* Chronic Respiratory Cases = cases with sinus infection, chronic bronchitis, etc. H.I.B. = Hæmolytic Influenza Bacilli.

None of the strains fermented lactose; most strains fermented dextrose and saccharose, and the majority of those tested, fermented maltose, but in general the fermentation reactions were not constant within the group. Some difficulty in obtaining good growth was encountered in these fermentation tests, and in some cases, stock strains were lost before the tests could be repeated. This may have been a factor in the inconstancy of the results. See Table I.

The results of agglutination tests seem to show no close relationship among the various strains studied. Specific agglutinations occurred with the four strains and their homologous antisera, but cross agglutinations did not occur above 1 in 320 dilutions, and these only in a minor number of instances.

These results correspond with those of agglutination reactions with non-hæmolytic influenza bacilli, as reported by Yabe,[26] Maitland and Cameron,[11] Fleming,[7] Wollstein,[25] Valentine and Cooper,[23] and others.

With reference to patients who had had tonsillectomies, it was noted that the infection was in most cases less severe, and in all cases convalescence was shorter, than in those with tonsils. That the tonsils may act as a local focus of infection for hæmolytic influenza bacilli however is opposed to Bloomfield's[1] observations.

(d) *Incidence of hæmolytic influenza bacilli.* See Table II.

In all, forty-five cases were examined. Twenty-seven had typical infections. All showed hæmolytic influenza bacilli present in large numbers. The six cases cultured at the height of infection showed them predominant. Five others cultured within a week of onset, also showed them predominant. Fourteen contacts had these organisms present in their throats. Four contacts were never shown to harbour them. One patient who had an acute laryngitis with temporary aphonia, had a great many of these organisms in his throat, with marked decrease as convalescence began. Two contacts, apparently normal in all respects, harboured these organisms in moderate numbers for a couple of months.

Another point of note was that the cases cultured during convalescence showed relatively fewer colonies of hæmolytic influenza bacilli while those that had recurrences, showed an increased number at times of such. Finally, in nearly all the cases cultured some time after the epidemic there were but few of these organisms present, in some, none.

Discussion.—Since the original description of Bacillus "X", now shown to be a hæmolytic influenza bacillus, by Pritchett and Stillman,[16] study of this organism has been limited to a few workers. The original workers encountered it in about two dozen persons and regarded it as non-pathogenic. Stillman and Bourn[20] apparently also regard it as non-pathogenic, while Bloomfield[1] states that it is not a member of the constant habitual flora of the upper air passages, and was not associated with acute disease or local foci of infection, except perhaps in occasional cases of his series. The latter author does however, say that it was isolated from normal throats and persons with "colds", and that it was almost uniformly present in cultures taken in November and December of 1920, when colds were prevalent. Rivers and Leuschner[18] state that hæmolytic influenza bacilli were present in 30 per cent of throat cultures taken from forty normal medical students in October, 1919, and during the 1920 outbreak of influenza in 25 per cent of fifty-two throat cultures. None were isolated from the lungs or blood cultures at necropsy. They also say "that as far as known they are non-pathogenic for man." They conclude that it is best to regarrd all hæmolytic, aërobic, non-motile, Gram negative, hæmoglobinophilic bacilli as influenza bacilli, and disregard confusing terms as Bacillus "X", which, in itself, represents a group of organisms.

Valuable contributions especially regarding growth requirements and cultural characteristics have been made by Rivers[17] and more recently by Kristensen[30] and Fildes.[6]

Miller and Branch[33] in 1923 give a fairly detailed account of a case of subacute bacterial endocarditis due to a hæmolytic influenza bacillus.

One wonders then, if it is not possible, that from time to time certain strains of different organisms give rise to more or less wide-spread epidemics or respiratory infections, each with its fairly distinct clinical picture, and that there is no single organism responsible for all the infections roughly classified as "colds" or "influenza". It is of course generally recog-

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FIG. 1.—Sheep blood agar plate after twenty-four hours' incubation. The predominant colonies are streptococcus viridans. No hæmolytic influenza bacillus colonies are seen.

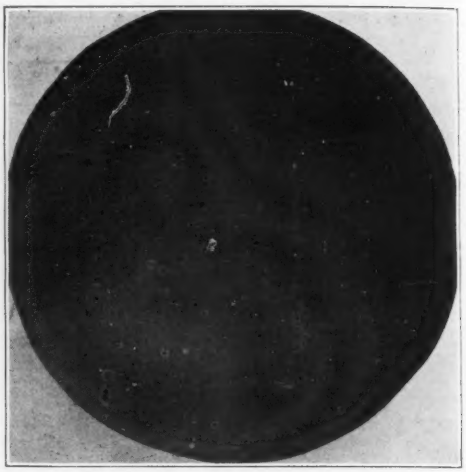

FIG. 3.—Sheep blood agar plate Fig. 1, at the end of forty-eight hours' incubation, showing the colonies larger. The alpha hæmolysis about the streptococcus colonies is more marked. No influenza colonies are seen.

FIG. 2.—Rabbit blood agar plate after twenty-four hours' incubation showing hæmolytic influenza bacillus colonies predominant. They are large and surrounded by a wide zone of hæmolysis. There are as many *S. viridans* colonies present as on the sheep blood plate, Fig. 1, but they are not so well developed, the green zone smaller, and they are obscured by the growth of influenza colonies.

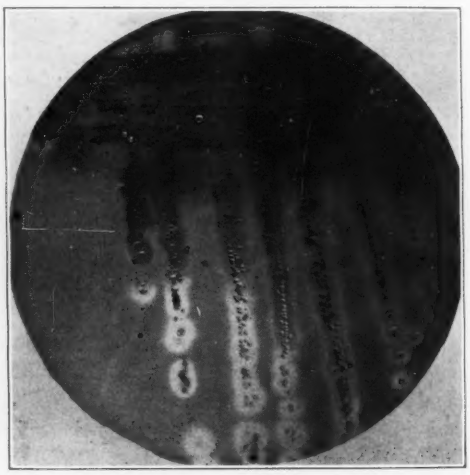

FIG. 4.—Rabbit blood agar plate of Fig. 2, at the end of forty-eight hours' incubation. The influenza colonies show only slightly more hæmolysis, while the other colonies are somewhat larger.

Figures are photographs of blood agar plate cultures, x one, taken by transmitted daylight, using Wratten M. plates. They are throat cultures from a typical case, (G.R.C.), taken at the height of the infection, forty-eight hours after onset of symptoms.

nized that hæmolytic streptococci can give rise to upper respiratory infections. But other than this, there is no general agreement as to the ability of any one organism of itself, to give rise to upper respiratory disease, excluding perhaps, affections of the air sinuses.

The present epidemic reported, is an example of one kind of upper respiratory infection, and would be classified as a "cold" or "influenza" by many physicians. Bloomfield[2] has made a classification of common colds into three groups and lays particular stress upon differentiating the primary infection from complications. This point has been considered in this series of cases, which have been uncomplicated, and so particularly suited to study

for this very reason. It has been noted that since the pandemic of influenza there has been a tendency to relegate all sorts of obscure infections to the already complex "influenza".

Many workers regard the association of Pfeiffer's non-hæmolytic bacillus as the cause of epidemic influenza, particularly since the extensive work of Opie, Blake, Small and Rivers,[14] Holman,[8] Kristensen.[10] Pfeiffer[15] also still thinks this organism to be the most probable cause. This conclusion has been arrived at although serology lends little in its favour. While immune rabbit sera gives marked agglutination with homologous strains of organisms, there is slight and inconstant agglutination with heterologous strains. This has been the result of agglutinations with these hæmolytic influenza bacilli also. This characteristic was therefore not unexpected with organisms so closely related.

In so far as they were investigated, these strains of hæmolytic influenza bacilli were not shown to be pathogenic for laboratory animals. The question of suitable animals and the proper inoculation and conditions to reproduce a disease as influenza, experimentally, is a difficult one. Investigators have found it impossible to reproduce the picture of influenza in animals with non-hæmolytic influenza bacilli, except perhaps in monkeys.[14]

However, the fact that in all cases examined, showing symptoms clinically typical of this London epidemic, when cultures were made on suitable media at the height of the infection, there was a predominance of hæmolytic influenza bacillus colonies, seems to point to the etiological relationship of this organism to the epidemic. On the other hand, if one holds that in order that an organism be shown to be the cause of an epidemic, all strains must be the same antigenically, we would have to throw out the evidence in favour of the above. Koch's postulates have not been fulfilled any more than in the relationship of the non-hæmolytic influenza bacilli to epidemic influenza.

It seems therefore, that these hæmolytic influenza bacilli, which form a rather definite group, are in some way closely related to this epidemic, although not proven to be the etiologic agents, and at any rate, the conditions in the pharynx were suitable for their development.

Summary

1. Hæmolytic influenza bacilli were isolated from throat cultures in forty-one out of forty-five persons during an epidemic of acute respiratory infection, which occurred in the city of London, Ontario, and surrounding district, in the winter and spring of 1925. Twenty-seven patients and eighteen contacts were cultured. Six cases at the height of the infection, and five others examined within a week of the onset, showed these organisms predominant. These cases, when cultured some time after the epidemic showed few of these organisms present; in some, none. Morphologically and culturally, these strains were very closely related. Immune sera with high titer were readily prepared. Agglutination reactions with twenty-seven strains showed a lack of close relationship; cross-agglutinations occurring with only a few strains, in low dilutions. These organisms may bear the same relation to this epidemic that the non-hæmolytic influenza bacilli bear toward epidemic influenza.

2. Plain meat infusion rabbit blood agar is the most suitable medium for isolation of hæmolytic influenza bacilli, and plain meat infusion sheep blood agar for detecting *streptococcus viridans*. Failure of growth of hæmolytic influenza bacilli on sheep blood agar is due to lack of the necessary enriching substance in the sheep blood cells rather than to inhibiting substances in the serum.

3. The throat streptococci encountered, belong chiefly to the salivarius group of *streptococcus viridans*.

4. Several strains of hæmolytic *micrococcus pharyngis siccus* were isolated. No reference to such strains can be found in the literature.

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PAROXYSMAL TACHYCARDIA*

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CLINICALLY, tachycardia is of frequent occurrence. It is to be observed in fright, fever, hyperthyroidism, at the menopause, and is a frequent concomitant of otherwise uncomplicated cases of mitral stenosis. But from this type, paroxysmal tachycardia must be differentiated. In it there is displacement of the pacemaker from the sinus node to the auricular myocardium, the A-V node, or the ventricle. It is thus divided into two broad groups, those of auricular and those of ventricular origin.

Attacks may occur at any age, though they are uncommon in childhood. They are most frequently observed in early adult life, and males[3] appear to be somewhat more often affected than females. The attacks are frequently associated with endocardial or myocardial involvement, although they may occur in cases where there is no previous history of an infection. Ventricular tachycardia may occur in cases of coronary artery thrombosis, and it has been shown to occur in association with severe acidosis.[15] In those subject to attacks, extra-systoles are usually seen, the focus of origin of the paroxysmal attack being generally similar to that of the extra-systole in a given case.[1]

Characterized by sudden onset, the heart rate rises to 150-230 beats per minute. Nervousness, restlessness, and weakness are pronounced. The duration of an attack has been described by Lewis[2] as follows: "Individual paroxysms in a given case are of fairly constant duration; from subject to subject the duration is very variable. A single paroxysm may consist of six or more beats; it may continue for an hour, a day, a week or more without interruption. Paroxysms lasting more than ten days are extremely rare. . . ." Whereas attacks lasting a few minutes may cause little or no discomfort, those lasting a few hours are associated with distressing symptoms. Precordial pain may vary from slight discomfort to that of an anginal character, radiating to the left arm and to the abdomen. Palpitation is noticed, and pallor, which may have been in evidence during the early stages of an attack, gives place to a marked degree of cyanosis. This is to be observed in the ears, the lips, and finger nails. Attacks lasting more than twelve hours are generally accompanied by evidence of failing circulation. This last factor seems to be

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proportionate to the degree of previous myocardial damage. The liver becomes enlarged, tender and pulsatile; there is congestion of the lung bases, and, if the attack is of sufficient duration, œdema of the extremities may develop. At the onset, there is generally a slight rise in fever which may persist for a few days after the cessation of the attack. Leucocytosis is common, and cases have been reported[4] in which the white blood count was as high as 20,000. These two factors were ascribed to the cardiac disturbance rather than to an infection. Auricular fibrillation occasionally succeeds an attack. Such a case will be described later. The paroxysmal attack terminates abruptly, generally followed by occasional extra-systoles. The patient immediately experiences a sense of relief.

Lewis[3] has pointed out that a normal heart responds to increase in rate by a decrease in size. Where there is an imperfect myocardium, the response may be an immediate increase, or, as more frequently occurs, there is a temporary decrease with a subsequent increase in size. With great acceleration of the heart there is a marked fall in the arterial pressure which Lewis[5] claims is accompanied by an increase in the venous pressure. Where the reserve power of the heart is lowered, due to a damaged myocardium, the fall in pressure is more marked, cardiac dilatation is frequently seen and venous stasis follows.

Levine and Golden,[4] in a series of eleven cases of tachycardia, found in seven of them a tendency for the pulse pressure to decrease. This was brought about by a fall in the systolic pressure accompanied by a rise in the diastolic pressure. Regarding dilatation of the heart, these authors found that in eight out of their eleven cases no appreciable cardiac dilatation during the attack could be shown. Dilatation was definite, but slight, in two cases. In one case it was marked. All measurements were made by Roentgen ray examination. They concluded that diminution of the pulse pressure and cardiac dilatation were dependent upon the rapidity of the ventricular rate, the duration of the attack, and the state of the heart muscle.

Paroxysmal ventricular tachycardia is, fortunately, a much rarer condition, the prognosis in many of these cases being distinctly less favourable. The gravity lies in the frequency with which it terminates in ventricular fibrillation, which is, apparently, incompatible with life. In eighteen cases of paroxysmal tachycardia, Vaughan[13] found a ventricular rhythm in only two cases; both of these returned to normal. Willius,[14] at the Mayo Clinic, found it to be present in only 0.047 per cent of all abnormal electrocardiograms.

Relating to the etiology of ventricular tachycardia, attention was drawn some years ago to the frequency with which ventricular extrasystoles followed experimental ligation of the descending branch of the left coronary artery,[1] and the close relation of coronary artery thrombosis to ventricular tachycardia has been pointed out.[6, 7] Occlusion of a large branch of the coronary artery, or even a main trunk is compatible with life[8], and though death may, and frequently does occur, it may be postponed for several hours or even days so that a complete functional recovery ensues. Herrick has pointed out that the end results are influenced by the blood pressure and the condition of the myocardium not immediately affected by the obstruction, and by the ability of the remaining vessels to carry on their work. Krehl[22] has divided cases of coronary thrombosis into three clinical groups. First, those cases where death is sudden, due presumably to the development of ventricular fibrillation. Second, those cases in which the attack is anginal in character and accompanied by profound shock. These cases usually die in a comparatively short time. Third, those non-fatal cases which usually have mild symptoms. It is in this last group that ventricular tachycardia may develop.

The mode of onset and symptoms are similar in auricular and ventricular tachycardia but may possibly be differentiated by the rhythm. Whereas regularity of the rhythm is a feature of the auricular type,[9] that of the ventricular is often irregular.[12] Although the paroxysmal attacks are generally of one definite type, a case has been reported[10] of an irregular ventricular tachycardia complicating one primarily auricular in origin.

Case 1.—Auricular tachycardia with change in the electrical axis on recovery.

A boy, O. H., fourteen years of age, was admitted to this hospital on February 10, 1925, complaining of great shortness of breath, palpitation, precordial pain and sleeplessness.

The history was that shortness of breath had been present since childhood, but that he had been able to carry on all ordinary activities. In 1923 he developed

a tremor of the right arm and leg. Following treatment, the condition cleared up in six months. Dyspnœa on exertion then became greatly increased. This continued till one year previous to admission when he noticed attacks of palpitation. These would come on suddenly and would stop suddenly; they would last for a period of from seven to eleven days, and would be accompanied by precordial pain, obliging the patient to take to bed. During the attacks nausea and vomiting occurred. During the past three years he has only been able to attend school for six months, and has been unable to engage in any sports owing to the above symptoms. Just previous to admission he developed a sudden attack of palpitation, accompanied by marked dyspnœa and precordial pain, the latter radiating to the epigastrium, and through to the back. Other than the indefinite history of chorea three years ago, the history of no other infections was obtainable. The appetite was fairly good. The bowels were regular. He smoked moderately. The family history was unimportant.

Examination showed a well developed and well nourished boy, evidently in great distress and complaining of marked precordial pain radiating to the epigastrium. The face was of a muddy pallor; the cheeks were slightly flushed, and the ears, lips, and finger nails were greatly cyanosed. There was some belching of gas. The pulse was regular, 208 per minute, of small volume, systolic blood pressure 102. The diastolic pressure could not be obtained. Over the precordium there was a diffuse pulsation, extending to the neck and to the epigastrium. Pulsation was observed in the jugulars. On palpation, a slight presystolic thrill was present. The heart was moderately enlarged to the left and to the right. On auscultation the sounds were very rapid and regular. A short presystolic murmur led up to an accentuated first sound at the apex. The sounds at the base were indistinct. There was some rigidity and considerable tenderness in the right upper quadrant of the abdomen. The liver was enlarged to 8 cms. below the lower costal margin. Definite pulsation was noticed. The urine was acid; its specific gravity 1016; albumen +; sugar 0; microscopic examination revealed no red blood cells or casts. Estimation of the red blood cells showed: red blood corpuscles 5,500,000; white blood corpuscles 4,700; hæmoglobin 80 per cent. The temperature showed sharp elevations, the highest point reached being 102° on February 22nd. On admission the patient had a heart rate of 210 per minute. On February 18th, eight days later, the rate was 194, and still regular. During this period the patient received 1.2 grm. of quinidine sulphate by mouth. This was given in divided doses of 0.2 grm. on the eleventh and twelfth, and was

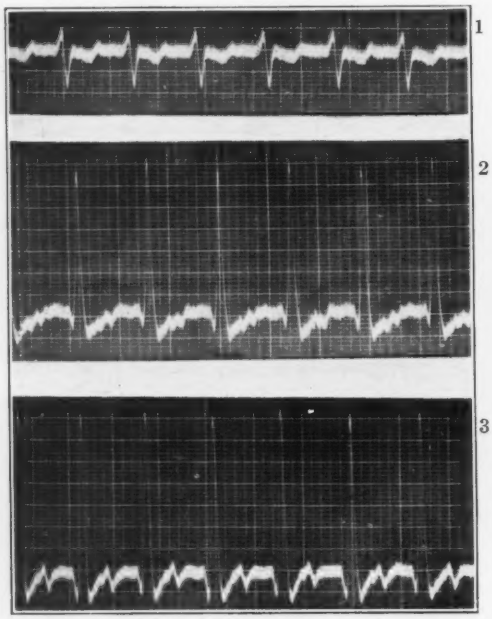

FIG. 1.—*Case 1.*—Right preponderance. Paroxysmal auricular tachycardia; rate 210 per minute.

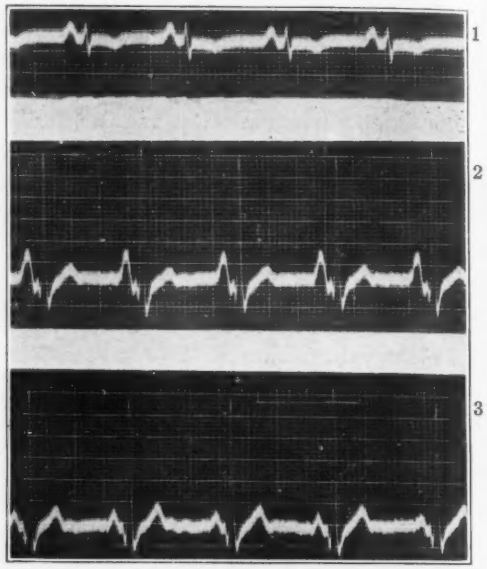

FIG. 2.—*Case 1.*—There is some shifting of the electrical axis. Rate 83 per minute. An unusual "P" deflection is present in the second lead. The auriculo-ventricular conduction time is 0.126 seconds. The "T" deflection in the first lead is still inverted.

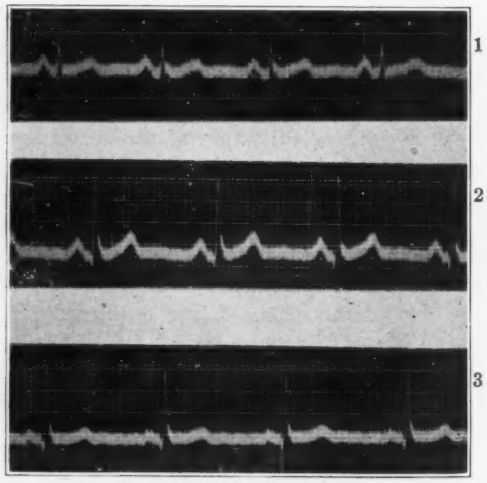

FIG. 3.—*Case 1.*—The tracing now shows no preponderance. The intraventricular conduction time is normal. The auriculo-ventricular conduction time is now 0.163 seconds. The "T" deflection is now upright in the first lead.

discontinued on the thirteenth. Venesection was performed on February 16th and 250 c.c. of blood were withdrawn. On February 20th, ten days after the onset of the attack, his pulse suddenly fell to 93 per minute accompanied by great improvement in his general condition. Auscultation of his heart now revealed definite evidence of aortic regurgitation and mitral stenosis.

Case 2.—Auricular tachycardia with development of auricular fibrillation.

A man, J. K., thirty-one years of age, was admitted to this hospital on January 11, 1915, complaining of palpitation and shortness of breath.

His history was that four years previously he had an attack of acute rheumatic fever. Three months later he had a mild relapse and at this time noticed an attack of palpitation. These produced a sensation of pulsation in his head and were accompanied by great dyspnœa. An attack would last about one hour. Since that time there had been many attacks of a similar nature. These were often terminated by lying flat on his back and taking deep breaths. Four days previously he had an attack which lasted twelve hours. There had never been any precordial pain, though at the onset of an attack there was a sensation of faintness. He had never lost consciousness. There had been no nausea or vomiting. There was a tendency towards constipation, and when very constipated he was more liable to have an attack. He used alcohol and tobacco moderately. The present attack came on suddenly four hours previous to admission. Other than two attacks of tonsillitis prior to the rheumatic fever, his personal history was unimportant.

Examination showed him to be restless and very dyspnœic. There was no cyanosis. The pulse was regular, 224 per minute. Respirations 36 per minute. There was slight engorgement of the jugular veins. Slight precordial bulging was present. The heart showed no enlargement. The sounds were regular, very rapid, and there was marked accentuation of the first sound at the apex followed by a systolic murmur. The pulmonary second sound was accentuated. Neither the liver nor the spleen were enlarged. The urine had a specific gravity of 1015; albumen +; sugar 0. Microscopic examination revealed hyaline and granular casts.

The attack ended abruptly eight hours after admission. For several days the rhythm remained normal, when it was again interrupted by attacks lasting from one-half to two or three hours. The termination of such an attack is shown in Fig. 4. After a period of about twelve hours, during which time the rhythm was normal, the pulse became very irregular, and auricular fibrillation was diagnosed. The auricular rate was approximately 375 per minute; the ventricular rate 81 per minute.

Case 3.—Paroxysmal ventricular tachycardia with marked irregularity of rhythm.

A girl, S. C., thirteen years of age, was admitted to this hospital on January 27, 1914, complaining of precordial pain, palpitation and dyspnœa.

She gave a history of acute rheumatic fever with endocardial involvement in 1909. Six months later she developed scarlet fever. In 1910 she had a second attack of rheumatic fever. Examination at this time showed multiple joint involvement together with definite signs of mitral stenosis and insufficiency. The pulse was regular, 120 per minute. No enlargement of the liver was noted. Following this attack, and up to the time of admission, she had complained of precordial pain, palpitation, and dyspnœa on exertion. There was no œdema. She remained at home for one year but had been attending school for the past six months. Two weeks previous to admission, while walking, she suddenly developed marked dyspnœa and palpitation, and was obliged to take to bed. She had been very restless and nervous and since the onset had slept very little. There had been a constant irritative cough. Marked precordial pain, palpitation, breathlessness, and orthopnœa had been constant features. Four days previous to admission she suddenly developed a sharp stabbing pain in the left upper quadrant of the abdomen. Three days later she vomited on four occasions. The urinary output was not diminished. The bowels were constipated.

Examination on admission showed the marked dyspnœa and orthopnœa referred to. There was only slight cyanosis. There was no œdema or ascites, and no clubbing of the fingers was observed. There was a persistent, unproductive cough. The pulse was grossly irregular, the average rate being 110-130 per minute. There was marked pulsation over the entire precordium, with slight bulging of this area. A definite pre-systolic thrill was palpable. The heart was moderately enlarged to the left and to the right. The sounds were very irregular in rhythm and in intensity. The heart rate varied from 180 to 225 beats per minute. A pre-systolic murmur led up to a sharply accentuated first sound at the apex. This was followed by a blowing systolic murmur. A few moist râles were present at both lung

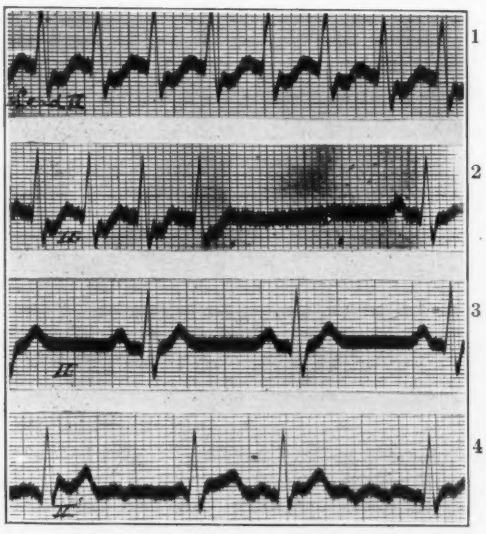

FIG. 4.—*Case 2.*—Tracing 1 paroxysmal tachycardia; rate 233 per minute. Tracing 2 shows the tachycardia with return to normal rhythm. Tracing 3 shows the normal rhythm. Tracing 4, the patient now shows auricular fibrillation. Auricular rate 375 per minute. Ventricular rate 81 per minute. All tracings are lead II.

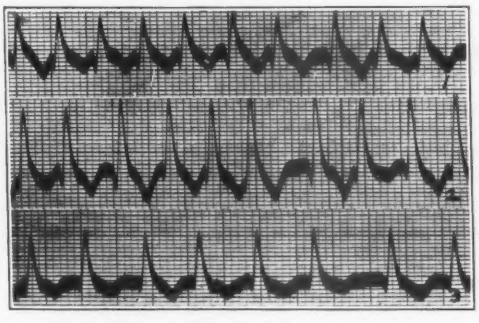

FIG. 5.—*Case 3.*—Paroxysmal ventricular tachycardia, rate 225 per minute. Marked irregularity is to be observed.

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bases. The liver was enlarged to 7 cms. below the lower costal margin. No pulsation was noticed. The cardiac rate continued. On January 30th passive congestion developed at both lung bases. The patient became progressively weaker, and died the following day. The electrocardiogram (Fig. 5) showed a ventricular tachycardia, rate 225 per minute.

Autopsy findings were those of fibrous and vegetative endocarditis of the mitral valve and left auricle. There was dilatation of the heart. Briefly, the findings in the heart were: An adherent pericardium over the left apical border. The right auricle was dilated. The left and right ventricles and left auricle were considerably hypertrophied. The edge of the mitral valve was shortened and thickened by white mature fibrous tissue. There was partial obstruction to the orfice and insufficiency. The chordæ tendinæ were shortened and thickened. The papillary muscles were thickened. The coronary arteries were normal. The findings in the viscera were those of passive congestion. There was no anatomical explanation of the severe attack of pain in the left upper quadrant of the abdomen prior to admission.

Case 4.—Ventricular tachycardia with intermittent attacks over a number of years.

A boy, A. F., fourteen years of age, was referred to this hospital for electrocardiogram on March 4, 1919. His history was that he had been subject to attacks of palpitation "as long as he could remember." His uncle, a physician, stated that he had first observed them in early childhood. The duration of an individual attack varied from a few hours to three or four days; those of more than a few hours' duration were accompanied by slight dyspnœa. There was no precordial pain and he was able to continue his ordinary activities. His family knew of the condition, though little attention was paid to it. He was attending boarding school, and had not lost any time recently through illness. There was no previous history of any infection.

Examination of the heart revealed no enlargement. There were no murmurs present. Since that date he has completed his work at school and is at present in his third year at the university. He has participated in all ordinary activities, and is not unduly short of breath on exertion. For the past few years he has had no sensation of attacks. Examination on October 7, 1926, revealed a pulse regular in rhythm, with intervals of irregularity. His blood pressure was 130/80. Examination of the heart showed no enlargement. The sounds were of normal intensity. There was a short, smooth, systolic murmur at the pulmonary area. They were otherwise clear. The electrocardiogram (Fig. 6) shows a ventricular tachycardia of 150 per minute. The abnormal rhythm is interrupted by occasional normal beats. The tracing (Fig. 7) taken in October, 1926, shows a rhythm disturbed by frequent groups of ventricular extra-systoles.

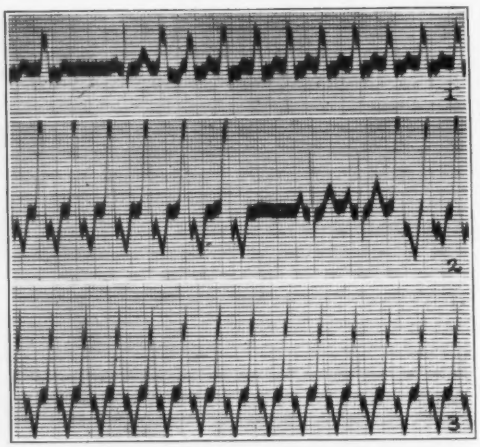

FIG. 6.—*Case 4.*—Paroxysmal ventricular tachycardia; rate 150 per minute. Retrograde "P" deflections are to be observed. The abnormal rhythm is interrupted by a normal beat in the first lead, and by two such beats in the second lead.

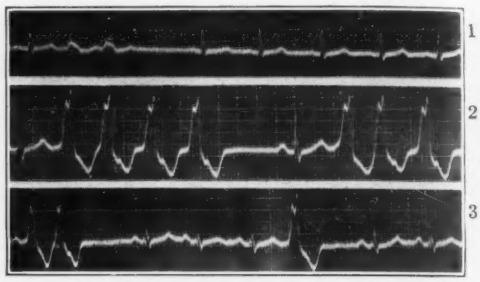

FIG. 7.—*Case 4.*—Tracing taken in October, 1926. The rhythm is disturbed by right ventricular extra-systoles occurring singly and in groups.

Case 5.—A case of ventricular tachycardia occurring with acidosis.

A female, M. K., sixty-one years of age, was admitted to this hospital on June 13, 1925, complaining of thirst, stupor, frequency and dyspnœa.

The history was that she had been in her usual good health till three weeks before when she became constipated. Twelve days previous to admission, she became very weak, run-down, and developed a great thirst. She was unable to eat, and took only fluids by mouth. On June 4th she first consulted her physician, who found her urine to contain 5 per cent of sugar. On June 8th it contained 2 per cent sugar, but she became progressively weaker and was confined to bed. The day previous to admission she became drowsy, her respirations became slower and somewhat noisy. No odour of acetone was noticed on her breath. She was conscious up to time of admission to the hospital. She had had twelve children. Her past history and family history were unimportant.

Examination on admission showed the patient to be semi-conscious and stuporose. The face was flushed, the extremities cold. There was some evidence of dehydration; the eyes were sunken; the skin was dry. The pulse was regular except for occasional extra-systoles; volume fair. The vessel was somewhat thickened. Blood pressure 150/70. Heart showed neither a forceful impulse nor palpable thrill. There was slight enlargement to the left. The sounds were only of fair intensity. A soft systolic murmur was present at the apex. Urine: specific gravity, 1017; albumen +; sugar ++; acetone +; diacetic acid +. Microscopic examination revealed hyaline and granular casts.

Blood findings:		
Blood urea	0.45 grm.	per litre
Blood ureau N.	21. 28 mgm.	per 100 c.c.
Uric acid	3. 77 mgm.	per 100 c.c.
Creatinine	1.43 mgm.	per 100 c.c.
Blood sugar	0.30 %	
CO_2 capacity		
Plasma	13. 7 volumes	per cent

The examination of the other systems was unimportant. The electrocardiogram (Fig. 8) taken with the patient in coma showed left preponderance. Regular rhythm; rate 110 per minute. Auriculo-ventricular conduction time normal (0.146 seconds). The unusual

"T" deflections in the second lead may suggest a toxic action on the myocardium. A second electrocardiogram, (Fig. 9) taken one hour before death, showed a ventricular tachycardia of 150 per minute. The patient remained in coma, the heart continuing at the rate mentioned. She died suddenly, one hour later, the mode of death suggesting the onset of ventricular fibrillation. A diagnosis of diabetes mellitus; acidosis (diabetic); myocarditis (toxic), and chronic nephritis was made.

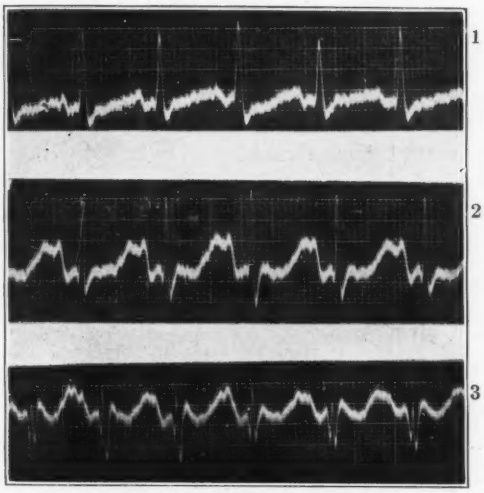

FIG. 8.—*Case 5.*—Left preponderance. Regular rhythm; rate 110 per minute. The auriculo-ventricular conduction time is normal. (0.146 seconds). The unusual "T" deflections may suggest a toxic action on the myocardium. Variation in the amplitude of the "QRS" deflections is to be observed.

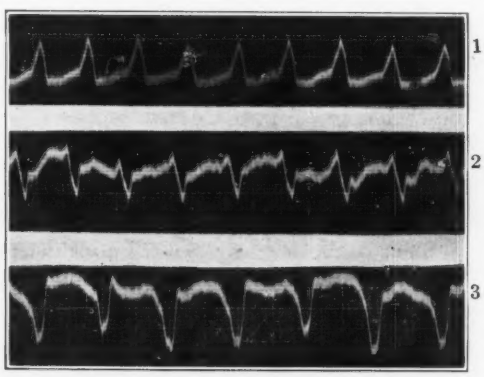

FIG. 9.—*Case 5.*—Ventricular tachycardia; rate 150 per minute. Slight irregularity of rhythm is to be observed.

Autopsy findings were those of essential atrophy of the pancreas. Myocardial degeneration. Dilatation of right side of the heart. Degenerative, exudative nephritis. *Heart.* There was considerable amount of pericardial fat. The right ventricle was dilated. The valves, except for some thickening of their cusps, showed no gross lesion. The musculature was dark reddish brown in colour, and was fairly soft. Histologically the fibres had lost their normal striations. They were pale staining, and had lost their continuity of surface, due to degeneration in places. Diagnosis: myocardial degeneration. A few atheromatous plaques were present in the aorta. The coronary arteries showed no gross lesions.

Discussion.—Of interest in Case 1 is the absence of leucocytosis in the presence of fever. Eight days after the onset of the attack the heart rate had fallen 16 beats per minute. Cases are reported[11] of gradual slowing of the heart rate under quinidine, but as this fall had taken place five days after quinidine medication had been stopped, it could hardly be ascribed to such an effect. Of interest also is the shifting of the electrical axis of the heart. On admission he had a definite right sided preponderance (Fig. 1). Resumption of a normal rhythm took place ten days after admission. Two days later there was some shifting of the electrical axis (Fig. 2). Sixteen days after recovery a marked change was observed in all leads, the tracing then showing no preponderance. (Fig. 3).

In Case 2 we have an auricular tachycardia later followed by a normal sinus rhythm. This in turn was succeeded by auricular fibrillation. Auricular fibrillation occasionally develops in cases of auricular tachycardia, several cases having been recorded where this has occurred.[16, 17] The presence of auricular extra-systoles, auricular tachycardia and fibrillation in the same case has suggested a common etiological factor, and attention has been drawn to the possibility that the extra-systole and tachycardia may also be due to a circus movement.[2]

Case 3 shows an irregular ventricular tachycardia developing in a case in which the myocardium had already been considerably damaged. The coronary arteries were apparently normal. While coronary artery disease is undoubtedly an important causative factor, the condition is occasionally present, particularly in young people, in which this is not the case. It appears, however, to be in most cases dependent upon myocardial disease. The interpretation of this tracing (Fig. 5) as a ventricular tachycardia, is based on the rate, the ventricular complexes, and the irregularity of the rhythm. There is some variation in the "QRS" deflections in the same lead. While a supraventricular rhythm, with the excitation wave pursuing an abnormal course

through the ventricles, must be considered, electrical preponderance in these cases is often seen. It is not present in this case. To explain the irregularity as a parasystolic event is not justified.

Case 4 shows a paroxysmal ventricular tachycardia, and is of interest in that the attack commenced at a very early age, and that while suffering from what has been considered a grave malady, few symptoms were present and there was apparently little myocardial damage. This would suggest that while we must bear in mind that ventricular fibrillation may at any time succeed an attack, the state of the myocardium will to a great extent influence the prognosis; a damaged cardiac muscle apparently favouring the more serious event. The electrocardiogram (Fig. 6), taken in 1919, shows a ventricular rate of 150 per minute. Retrograde "P" deflections are to be observed. The abnormal rhythm is interrupted by a normal beat in the first lead, and by two such beats in the second lead. The tracing (Fig. 7), taken in October, 1926, shows a rhythm disturbed by frequent groups of ventricular extra-systoles, the focus of origin being similar to that of seven years ago.

Case 5 shows a ventricular tachycardia in association with severe acidosis, and is somewhat similar to a case which has been reported.[15]

Treatment.—Paroxysmal tachycardia is sometimes abolished by vagal stimulation. This is often affected by pressure over the carotids; pressure in the supraorbital region; the repeated swallowing of sips of cold water; with head down, taking a deep inspiration; and by closing the glottis, attempting a forced expiration (Valsalva experiment). Wilson[18] has described a case in which hemiplegia and gangrene of the left arm developed and where vagal stimulation would bring about cessation of an attack.

Of medication, quinidine has been suggested. In a series of nine cases reported by Singer and Winterberg[19] in six of them, quinidine hydrochloride, given intravenously, terminated the attack within ten minutes. This was given in a single dose of 0.4; 0.5; and 0.7 grm. The most usual dose was 0.5 grm. This action, however, is not constant, as is seen in two of their cases. Scott[20] has reported a case of ventricular tachycardia in which the paroxysms were invariably terminated in from thirty minutes to one hour. The dose was 0.4 grm., given by mouth. This patient had no recurrence of the attacks while taking 0.2 grm. three times daily. An instance has been recorded[11] in which quinidine reduced the rate of beating, the paroxysms which previously had been short and frequent, became longer and eventually continuous; the fall continued until the paroxysmal rate approached closely that of the normal rhythm. This was succeeded by a normal rhythm.

In the auricular type, digitalis is often of value, its effect being possibly due to its action on the vagus. In cases of the ventricular type, its use would seem to be not without danger. Though in a case reported[20] digitalis minimized the severity of the attack, in cases of coronary thrombosis the known frequency with which ventricular fibrillation has followed its administration would render its use doubtful. Schwensen[21] has recorded two cases under treatment with digitalis who developed a ventricular tachycardia and died suddenly a few days later. He ascribes this to an irritable condition of the ventricles produced by the blood.

Where restlessness and dyspnœa are pronounced, morphia is indicated. An icecap to the precordium and to the head makes the patient more comfortable. Free purgation is essential. For nausea, milk of magnesia in cracked ice is often helpful. In cases where there is marked venous engorgement or signs of cardiac failure venesection is indicated.

I am indebted to Professor J. C. Meakins for permission to publish these cases.

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THE PRESENT STATUS OF CHOLECYSTOGRAPHY*

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THE results of x-ray examination of the gall bladder, in the past, have not been accepted by the medical profession with a great degree of confidence. I think there have been two reasons for this. In the first place, until 1922, our knowledge of the gall bladder was erroneous, as will be shown later, and in the second place, as might be expected, radiographic technique has considerably improved. The outstanding improvement in technique was the introduction of opaque material into the gall bladder itself, by Graham and Cole[1] as announced in February, 1924. Radiology is the youngest branch of medicine and a young specialty, like a young man, tends to enthusiasm rather than cool thought. At all events this questioning attitude of the older branches of medicine has probably had some effect in stimulating further effort and research.

Since the first gall stone shadow was shown on an x-ray plate, by Carl Beck[14], in 1899, and since Cannon examined the movements of the digestive tube, by feeding large doses of bismuth to dogs, clinicians have looked forward to a time when an opaque substance could be introduced into the gall bladder in order that its size, contour, and movements, could be further studied. That time has arrived. In the last two and a half years it is estimated[2] that about fifteen thousand x-ray examinations of the gall bladder have been made, using this method or one of its modifications; a brief summary of its technique, rationale, and results, may be of interest.

The logical basis of the procedure rests on the observations of Abel and Rowntree,[11] who, in 1909, found that the liver secretes the halogen compounds of phenolphthalein, and, knowing that bromine and iodine possess sufficient atomic weight to cast a good x-ray shadow, Graham and Cole[1] found that the gall bladder was well depicted following the intravenous injection of tetrabromphenolphthalein. Many of the halogen compounds of phenolphthalein have been used experimentally[3] but the sodium salt of tetrabromphenolphthalein and the sodium salt of tetraiodophenolphthalein are the most practical. The iodine salt, because of its greater atomic weight, gives a good shadow, when half the quantity is used and the chances of toxic reaction are thereby reduced in proportion.

There are four routes by which the drug may be introduced into the circulation:— (1) Orally. (2) Intravenously. (3) By means of the duodenal tube. (4) By the rectum. Rectal injection is uncertain and irritating. A solution of the dye may be placed in the duodenum by means of the duodenal tube[4] while doing a diagnostic or therapeutic drainage. This method has caused a rather high percentage of severe toxic reactions and, although the radiographic results are brilliant, it is not advised as a routine.

* Read before the annual meeting of the Alberta Medical Association, Edmonton, Sept. 8, 1926.

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There remain the oral and the intravenous routes and both are commonly used.

Given intravenously the technique is similar to injecting salvarsan. The point is that the drug must be of known purity. In its early use severe reactions were experienced, due, no doubt, to impurities in the dye. Organic iodine compounds oxidize very quickly in the presence of light and air hence the necessity of protection from both.[5] The intravenous use is contraindicated in the following conditions:[6] (1) Obstruction of the common bile duct. (2) Extensive hepatic destruction. (3) Hypertension. (4) Cardiac disease, especially auricular fibrillation. In connection with the intravenous method it should be mentioned that Dr. Graham and his associates[7] have introduced a new dye which they claim has overcome many of the objections formerly experienced. This compound is phenoltetraiodophthalein the isomer of tetraiodophenolphthalein, and we have reason to believe that this dye will eventually prove to be the one of choice.

FIG. 1.—*Case 1.*—Gall bladder fifteen hours after the oral administration of tetraiodophenolphthalein. Normal shadow.

Up to the present time I have used the oral method only and have found it simple and satisfactory. In hospitalized patients the intravenous injection is claimed to have some advantages, but I have been waiting until I could be reasonably sure that there would be no danger of unpleasant reactions. Considering intravenous medication in general Hanzlick says, "The burden of proof rests on those who assert that intravenous injections are not injurious or dangerous."

To give the dye orally, five gelatin capsules containing seven and a half grains each are dipped in a weak formaldehyde solution (10 per cent), allowed to dry until sticky and then enclosed in a larger capsule. Gelatin in the presence of formaldehyde results in the formation of glutoid which is insoluble in the acid contents of the stomach but soluble in an alkaline medium. A patient weighing under one hundred and twenty pounds is given four capsules or thirty grains of the drug. Instructions are given to swallow the capsules at intervals during the evening meal, drink plenty of water, omit breakfast, and report for x-ray at nine o'clock the following morning. At twelve o'clock,or eighteen hours after the capsules were given, plates are made and the patient instructed to have a light lunch, consisting of an egg sandwich with plenty of butter and a glass of milk. At twenty hours plates are made again and the gall bladder if normal will appear much smaller and more dense or will have emptied completely.[20]

FIG. 2.—*Case 1.*—Gall bladder eighteen hours after the ingestion of the drug. Density of shadow increased indicating concentration of the dye. Normal.

The interpretation of the radiographic findings, following cholecystography, is based upon a clear conception of the anatomy, physiology, and pathology, not only of the gall bladder, but of the stomach, duodenum, pancreas and liver as well. The nerve supply to these organs is the same, the vagus and the sympathetic from the ninth dorsal segment. This explains why

pylorospasm is such a common accompaniment of gall bladder disease.

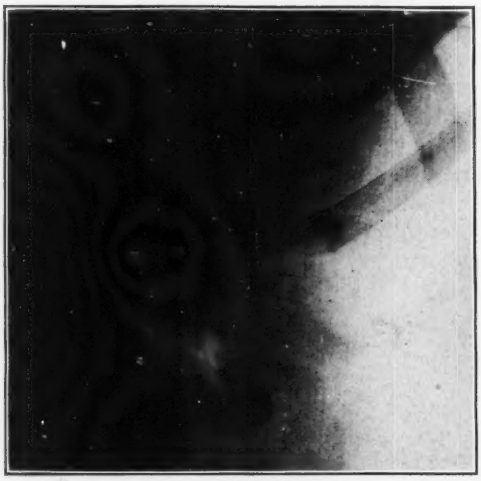

FIG. 3.—*Case 1.*—Twenty hours after taking the dye, two hours after a meal rich in fats. Gall bladder empty. Normal.

FIG. 4.—*Case 2.*—Gall bladder retaining the dye twenty-four hours after its ingestion indicating some form of obstruction of the bile ducts.

In this paper it may be necessary to remind you of the functions of the gall bladder as far as they are known because it is on these physiological premises that the superstructure of radiographical diagnosis is built. It was formerly thought that the gall bladder was simply a reservoir, to hold in reserve excess bile, but when it is considered that the liver secretes about a litre of bile in twenty-four hours and that the total capacity of the normal gall bladder is one and a half to two ounces, it is apparent that this view is untenable.[8] As far as is known this viscus, by means of its specialized mucous membrane lining,[8] has the power of concentrating the bile, that is of absorbing water and inorganic salts in about the proportion of normal saline solution. It has been shown experimentally that the bile as secreted by the liver may be thus concentrated to one-tenth of its original volume.[9] The gall bladder also acts as a regulator of the pressure within the ducts. In 1923, Dr. E. A. Boyen, an anatomist at Harvard University,

FIG. 5.—*Case 2.*—Duodenal bulb showing the irregular "saw tooth" deformity of adhesions. This was seen both before and after an antispasmodic (12 plates).

FIG. 6.—*Case 2.*—Appendix filled, fixed, segmented and tender ninety-six hours after the barium meal was given. At operation the gall bladder was adherent to the duodenal bulb, the appendix was fixed by adhesions as indicated on plate.

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working experimentally with cats, demonstrated that the feeding of a mixture of egg yolk and cream caused marked contraction of the gall bladder muscle and rapid emptying of this organ. This has been confirmed many times by cholecystography. To sum up, the gall bladder has the following known functions: (1) Concentration of the bile. (2) Regulation of the pressure within the ducts. (3) Muscular contraction following ingestion of fats.

FIG. 7.—*Case 3.*—Gall bladder filled with the dye. Gall stones (5) are seen as "negative shadows" that is they displace the more opaque dye in the gall bladder.

In order that the gall bladder may be of diagnostic importance, radiographically, (a) the liver must be in a sufficiently healthy condition to secrete the dye, (b) the cystic and hepatic ducts must be patent, (c) the lumen of the gall bladder must be of sufficient size to contain enough dye, (d) the mucous membrane lining must be capable of concentration, (e) its musculature must possess the power of contraction. Any pathological condition interfering with the above will interfere with the records on the films. If the liver parenchyma is largely destroyed by disease no shadow can be expected. Rosenthal[12] has shown, however, that the liver has a wide "factor of safety" and that extensive damage is required to impair hepatic function. Any disease of the hepatic or cystic ducts preventing, or partially preventing, the dye entering the gall bladder will result in no shadow or a very faint one. Obstruction of the common duct will prevent the emptying of this viscus. Disease of the gall bladder sufficient to obliterate, or partially obliterate, its lumen will show a corresponding radiographic defect. If there is no increase in the density of the shadow over a period of twenty hours, theoretically at least, it would indicate cholecystitis because there would be interference with the function of concentration. After a meal rich in fats the musculature should contract and empty the gall bladder. If this does not occur it is evidence of disease.

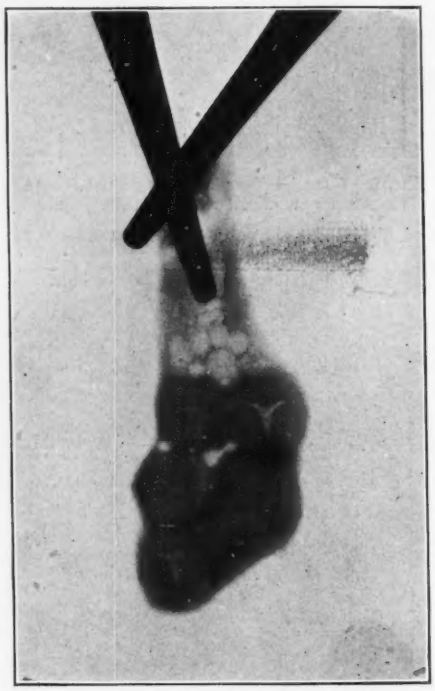

FIG. 8.—*Case 3.*—Radiogram of the gall bladder after removal at operation. The five stones are seen to be less opaque than the wall of the gall bladder itself.

Practically then, the principal radiographic signs of disease, so far worked out and proven, by this method, are:

1. Failure of the gall bladder to fill with the dye.
2. Failure of the gall bladder to empty after a meal rich in fats.
3. Failure of the gall bladder to concentrate the dye.
4. Mottling of the shadow by calculi or so-called negative shadows. (Fig. 1, Case 3).

Conversely a normal gall bladder should be oval

or pyriform in shape, homogeneous in density, and contract after a meal rich in fats.

There are many other x-ray indications of gall bladder disease which are very important, but it would be impossible to discuss them with any degree of satisfaction in a short paper. One cannot, with fairness, fail to mention the direct and indirect x-ray findings relied upon before the introduction of the dye test, and which, in expert hands and with good technique, are often sufficient. The depicting of gall stones on a film is difficult and requires an experienced technician. Poor technique accounts for more failures than the opacity of the stones. I believe that a radiologist's skill in technique and diagnostic acumen in interpretation may be safely judged by his success or failure in gall bladder work. "The greatest danger in x-ray work is faulty interpretation."[13]

I do not think that the examination of the gall bladder only is, a reasonable x-ray procedure, any more than is the examination of the appendix only. The regular gastro-intestinal examination, with the opaque meal is, with well defined exceptions, more reliable. Cholecystograms can be made before, after, or during the progress of the contrast meal through the tract.

The dye test is a recent one but to my mind one of its strongest recommendations is the fact that it has been universally accepted in the short space of two and a half years. It can also be supported by statistics. The late Dr. Carmen, of the Mayo Clinic, last year reported, at the International Congress of Radiology, as follows[15]: 825 patients were given the dye orally, of whom 140 were operated on. Of these 140 the radiological diagnosis was confirmed by the surgeon and pathologist in 86 per cent. Zink,[16] of St. Louis, gave the dye to 663 cases, of whom 131 were operated on. Radiological diagnosis was confirmed by surgeon and pathologist in 125 or 96 per cent. Sherwood Moore[17] reports surgical and pathological confirmation in 92.5 per cent of cases operated on. My own records show that I have given the dye 115 times, and as far as I can find out nineteen of these patients have been operated on. Of these nineteen, surgical and pathological confirmation has been given in seventeen, making a total correctness of 89.4 per cent.

When one considers that careful studies of statistics[18, 19] reveal the fact that gall bladder disease is the most common organic cause of dyspepsia, it is at once apparent that a method which results in approximately 90 per cent correct diagnosis must be of great value. Another advantage is that it detects early changes in the mucous membrane, as evidenced by the failure of this highly specialized tissue to concentrate the dye. The recognition of gall bladder disease when numerous gall stones are present and when the liver and pancreas are involved is rather late to expect a cure. The liver and pancreas are necessary to life. The late diagnosis of gall bladder disease is, as someone has said, "like making a diagnosis of pregnancy when the head is on the perineum."

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LEPTOSPIROSIS ICTEROHÆMORRHAGICA (WEIL'S DISEASE)
WITH REPORT OF A FATAL CASE*

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IT is just forty years since Weil[1] published an article drawing attention to "a peculiar form of acute infectious disease characterized by enlargement of the spleen, jaundice, and nephritis." In this paper he reported four cases which had come under his observation. He pointed out the resemblance of these cases to the "bilious typhoid" of Griesinger[2] and discussed the possibility that the disease might be an atypical form of known infections, but held that it should be regarded, at least tentatively, as a new type of disease.

Weil has no real claim to priority in connection with the description of this spirochætal form of jaundice, inasmuch as the literature antedating Weil's article contains numerous reports of epidemic outbreaks of jaundice, apparently infective in origin and of an unidentified nature. Indeed catarrhal jaundice is mentioned in the *De internis affectionibus*—frequently attributed to Hippocrates. Cleghorn[3] reported the first undoubted epidemic of catarrhal jaundice in Minorca in 1745. Batt[4] noted various epidemics along the Ligurian Coast in 1793, and Larrey[5] reported an outbreak of infectious jaundice among the troops of Napoleon at the battle of Heliopolis in 1800. Similar epidemics have since occurred, and have frequently been associated with armies. Hirsch[6], who gives an excellent enumeration of the various epidemics prior to his own time, estimates that in the American Civil War there were 42,569 cases of infectious jaundice, and Cockayne[7] states that during the Boer War there were not less than 5,648 cases. It is, therefore, not surprising that the disease was reported extensively among the armies engaged in the recent World War.[8 to 18]

Weil recognized the infectious nature of the disease and the fact that it occurred in localized groups and epidemics, noting the frequency of its occurrence among butchers. Other writers of the same and later periods noted a liability of the infection to occur among workers in sewers, mines, slaughter-houses, and ditches or trenches.

Although we can now recognize, on reviewing the literature, that the disease had been reported as early as 1745, it was not until early in 1915 that Inada[19] and others determined the etiological factor in the disease. Since that time abundant corroboration has been obtained to connect the *Spirochæta icterohæmorrhagiæ* (Inada) with this disease, and to establish it as a definite entity.

As has already been stated, the disease is more common among working men than others, and more particularly among those who are exposed to conditions involving environmental conditions of dampness of soil and the prevalence of rats. Its occurrence among butchers was believed by Fiedler[20] to indicate the possibility of poisoning from the handling of tainted meat. In view, however, of later observations it is agreed that the incidence among slaughter-house workers is not related to any such type of poisoning but is due to the fact that abattoirs are commonly teeming with rats. The two predisposing factors, dampness and rats, must both be present to produce this disease in its epidemic form.

It was in the western part of Japan where the disease occurs endemically, chiefly among workers in the mines, that the spirochæte was first demonstrated. In November, 1914, Inada[19] and his associates detected the spirochæte in the liver of a guinea pig injected with the blood of a person suffering from Weil's disease. Two months later, in January, 1915, they came to the conclusion that this spirochæte is pathogenic and is the cause of Weil's disease. They named it *Spirochæta icterohæmorrhagiæ*. They subsequently isolated similar spirochætes from cases

* Case reported at the sectional meeting of pathology, Academy of Medicine, Toronto, March 23, 1926.

occurring in widely separated localities and as early as the early part of 1915 they had detected in the blood of a convalescent individual a substance which exhibited a spirochæticidal power over this organism. They have since shown that the spirochætes are present in very small numbers in the blood in human cases, but that in the guinea pig they multiply freely and are found to be quite numerous in the liver.

The *S. icterohæmorrhagiæ* was first cultivated by Ito and Matsuzaki[21] using the method of Noguchi but employing guinea pig kidney rather than that of rabbit. The spirochæte is actively motile, there being fore and aft movements besides movements of the ends to right and left. There is also a spiral motion as well as the formation of waves along its long axis as if waves of contraction were transmitted along it. Its average length is 6 to 9 μ. The thickness varies, but is probably 0.25 μ. The ends taper sharply and are usually hooked. No flagellæ can be demonstrated. The undulations are not as regular as in the *treponema pallidum* and are usually composed of two or three large irregular waves or four or five smaller ones. When stained by Giemsa's solution they look uniform but under high magnification some of them show folds and they present a beaded appearance under dark field illumination owing to an uneven refraction of light. Noguchi[22] has studied the morphology of the organism with great care and states that the former investigators overlooked the true structure of the organism in that it possesses many spirals so minute that a specimen 9 μ in length would possess eighteen of them and that the presence of these spirals gives it the beaded appearance particularly noticed in the dark field examination. These minute elementary spirals are fixed and persist at all times in spite of various movements of the spirochæte and their depth does not exceed the diameter of the body,—facts which differentiate it from other forms of spirochætes. It shows the absence of a terminal flagellum or membranes and appears to move by means of a rotary motion of its terminal portions. Moreover, unlike the spironemata or treponemata, it withstands the action of 10 per cent saponin. Thus it does not belong to any known genus of spirochætoidia. Noguchi suggests a new genus, *Leptospira* (meaning "fine coils") and has named this organism "*Leptospira icterohæmorrhagiæ*". It most closely resembles a genus of spirochætes observed by Wolbach and Binger[23] in a fresh water pond near Boston. Noguchi also undertook a series of experiments to determine whether the cultures of the organisms from Japan, Europe and America were identical[24]. He injected vaccines from certain strains into guinea pigs and later he inoculated these immune pigs with the various strains. He found that a large dose of vaccine from one strain protected a pig against a subsequent injection of either of the other strains, *i.e.*, there was a group immunity; but that with smaller doses the protection was adequate against the identical strain only. He thus concluded that various strains exist. From similar immune reaction tests Soberheim[25] concluded that the Japanese and European strains were identical.

The mode of transmission of the disease is not clear though it has been studied at some length. Weil,[26] Schmidt,[27] Leick[28] and Fiedler[20] believed that the organism entered by way of the alimentary tract, while Hecker and Otto[29] believed that it might be communicated by the bite of a mosquito as is the case in yellow fever. So far as Japan is concerned, Inada[19] believes that the most common route of infection is by the alimentary tract, but that at times it enters through the skin and causes local swelling of the lymph nodes. Epidemics and sporadic cases following bathing[30, 31] or immersion in foul water[32 to 34] have also been reported but these cases do not differentiate between the cutaneous and alimentary tract mode of infection. They are of interest chiefly because in some of them the possibility of the incrimination of rats seemed remote to the authors,[23] while in others the leptospira were found in the water.[35, 36]

Experimentally the infection may be produced in guinea pigs by feeding them liver emulsion or by giving an enema of liver emulsion containing spirochætes. Thus the mucous membrane of the gastro-intestinal tract is susceptible to invasion by the spirochætes. Ido and Hoki[19] have shown experimentally that the spirochætes may penetrate the intact skin of a guinea pig in less than five minutes.

Although definite proof of the cutaneous route is not available, the following considerations suggest this mode as being common in Japan:

1. When the disease occurs in coal mines the patients are numerous among miners who work

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at a certain part of the mines. Numerous cases do not arise in the same barracks even when the disease originates there.

2. The clerks working outside the mines do not contract the disease.

3. Many cases occur in wet mines and few in dry mines, and no case occurred when the accumulated water was pumped out.

As has been demonstrated, the spirochætes can penetrate the uninjured skin of a guinea pig, and they will doubtless penetrate the skin of miners who are liable to abrasions and to skin lesions caused by working with the feet in water.

Early in 1915, Miyajima[37] reported the occurrence of spirochætes similar to *Spirochæta icterohæmorrhagiæ* in the kidneys of the field mouse. Subsequently Ido[38] and his co-workers demonstrated the presence of *Spirochæta icterohæmorrhagiæ* in the kidneys or urine of 37 per cent of rats. Since then a survey of house and wild rats in various countries has been undertaken. The incidence of the spirochætes was nowhere as high as that reported by Ido in the rat-infested mines of Japan except in the trench rats in Flanders where Stokes, Ryle and Tytler[39] found that 40 per cent were infected, and in Spain where Dalman and Balta[40] found spirochætes in thirteen out of fifteen rats. Jobling[41] reports their presence in 10 per cent of rats in Nashville, Tennessee; Neill[42] in 10 per cent of rats in Washington; while others report positive findings in England,[43 to 46] France,[47 to 50] Germany,[51] Austria,[52] Portugal,[53] Italy,[54] Russia[55] and the United States[24, 56, 57, 58]. Their presence has also been reported in rats in Africa[59], and in 1921, Noguchi[60] reported their presence in a number of wild rats in Ecuador. From this it may be assumed that their distribution in rats is world-wide.

It is now commonly believed that the rat harbours the spirochæte as a harmless commensal and that it acts, as Courmont[48] has suggested, as a "reservoir of infection". Schuffner and Ruys[61] have kept wild rats infected with these organisms for twenty-one months, being able to demonstrate the spirochætes in their urine throughout this period of time. It is not as yet clear in what manner the infection is spread to man. The bite of the rat seems to be of minor importance in the transmission of the disease but a few cases which were infected by this means are on record. Ido, Hoki, et al[38] report two cases in which a sudden onset occurred six and eight days respectively after the individual had been bitten by a rat. However, in the vast majority of cases such a history is lacking though it would be elicited if it had occurred. It is also possible that flies, fleas or other insects may assist in its transmission from the rat to the human but investigations along such lines have been negative except that Reiter[62] was able to transmit the disease by means of a biting fly (Hæmatopota pluvialis), the habits of which correspond to the seasonal features of spirochætal jaundice in that district. Since the spirochætes are found chiefly in the kidneys and urine of the rats, it seems improbable that insects could convey the disease directly from the rat to the human. In view of the fact that dampness of the soil and the presence of rats are both usually associated with the development of the disease, it seems reasonable to assume that the spirochætes which are excreted continuously by the rats in their urine and which are able to live in the moisture of the soil, become a source of contagion both to man and to other rats, and that the reservoir of contagion is thus maintained and even increased in regions where the rats are segregated. Goudsmit[34] has pointed out that practically all cases of acute infectious jaundice that have been reported have given a definite history of exposure to the presence of rats. In this connection it is interesting to note that certain reactions of soil are unsuitable for the existence of the spirochæte, just as mild acid reactions in media inhibit their growth. Dr. Takaishi[63] making chemical analyses of the soil in various mines in Japan, determined that the reaction of the soil in the mines free from Weil's disease was acid, while that of the soil where the disease was rife was alkaline. Toyama[64] verified this observation and has found calcium cyanamide suitable as a disinfectant of the ground. It seems probable that the infection reaches man through the skin by means of slight abrasions or even in their absence. This agrees with the prevalence of the disease among miners who work barefoot and among the troops on active service where they were frequently drenched.

The clinical course of the disease in the guinea pig is quite similar to that occurring in man. The incubation period in the former is seven to eight days (the outside limit being six to thirteen

days), while in man it is estimated as from six to twelve days, depending upon the virulence of the strain. Wadsworth[57] reports the onset of the disease in a laboratory worker on the seventh day after she had accidentally infected herself by a needle scratch in her finger, while in the two cases of infectious jaundice following a rat bite reported by Ido *et alii*,[38] the clinical onset occurred in the one case on the sixth day, and in the other case on the eighth day. In the seventy-six cases reported by Körner[30] the onset averaged eight days after the individuals had bathed in a certain contaminated pool. During the period of invasion before the septicæmia becomes established, subjective sensations of malaise are experienced though actual signs are wanting.

Inada[65] suggests a division of the disease into three stages: first, a febrile stage; second, an icteric stage; and third, a convalescent stage. Each stage has characteristic features in regard to the behaviour of the spirochætes in the blood, the production of antibodies, the excretion of the organisms with the urine and their distribution in the organs. Each of the first two stages lasts about one week and the convalescent stage begins about the third week.

1. *The febrile stage*: the onset is usually sudden, being ushered in by chills or high fever. There is giddiness, headache, and crampy muscular pains which are especially marked in the limbs, as well as gastro-intestinal disturbances such as anorexia and vomiting, and a feeling of weakness. The muscular pains may be so intense that even passive movements of the limbs or pressure on the muscles causes severe pain. There is usually marked hyperæmia of the conjunctiva. Jaundice appears during this stage, usually on the third or fourth day and reaches its maximum intensity on the seventh or eighth day. The yellow tint may become very intense but never presents a greenish or bronze hue. During this period the spirochætes are present in the peripheral blood, and though they may be few in number, blood taken during this period and injected intraperitoneally into guinea pigs causes a typical reaction. From about the fourth day onward the spirochætes decrease in numbers and are consequently absent from the blood in the second stage of the disease. They are excreted in the urine in this stage, and their presence may be demonstrated by animal inoculation. Their distribution for the most part resembles that found in experimental guinea pigs. Kaneko[66] has shown that they are present mainly in the liver, kidneys and adrenals, but are also found in the intestines, pancreas, skeletal muscles, heart, prostate, testis and urinary bladder. At first they lie extracellularly but with the development of immune bodies they come to lie intracellularly, and have actually disappeared from the blood stream and the liver by the sixth or seventh day.

2. *The icteric stage* begins at the end of the first week. Jaundice is already present but the symptoms of the first stage decrease in intensity. The temperature begins to decline and the gastro-intestinal symptoms become ameliorated. There remains marked general weakness and a tendency towards a hæmorrhagic diathesis. It is in this stage that death is most common. The spirochætes have disappeared from the peripheral blood and it is rarely possible to infect guinea pigs by the intraperitoneal injection of the patient's blood. Antibodies are now present in the blood and may be demonstrated by Pfeiffer's method. The spirochætes are numerous in the urine, where they may be demonstrated by dark field illumination. The distribution of the spirochætes in the body shows changes corresponding to the development of the antibodies. First they disappear from the blood and then from the liver. In the tissues they disappear first from the interstices and in the course of the disease only a few degenerated forms may be found lying within the stellate cells. They are now most numerous in the kidneys where they lie within the lumina of the tubules. Throughout the heart and various organs the spirochætes are found to lie within the parenchymal cells as though they were attempting to avoid the spirochæticidal substances within the blood.

3. *The convalescent stage* commences after the thirteenth or fourteenth day. The temperature is normal or even subnormal, the jaundice gradually fades and the condition of the patient improves. Anæmia and emaciation are present. By this time the development of antibodies is complete and the spirochætes are entirely absent from the blood and from all organs with the exception of the kidneys where they lie within the tubules in pockets close to the lining epithelium. The number of spirochætes excreted in

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the urine increases up to the fifteenth or sixteenth day and they may continue to be excreted up to the sixty-third day. The spirochætes lying within the lumina of the tubules actually proliferate and may be more abundant in the convalescent than in the icteric stage of the disease.

During the period of convalescence there is not infrequently a recurrence of rather high remittent fever which Weil and Fiedler have called "relapsing fever." Inada[65] points out that this rise of temperature should not be considered as a relapse since there is no recurrence of the main symptoms; infection experiments on guinea pigs are negative; and no spirochætes are present in the blood as the spirochæticidal antibodies are fully developed at this time. Clinically, no particular changes are observed in the various organs during this febrile stage; no complications or suppurations occur; and on bacteriological examination the blood is sterile. He regards this fever as a reaction of the immune organism to resorption of the spirochætal toxins in association with the disintegration of the spirochætes within the organs, particularly the kidneys.

The diagnosis of the disease presents many difficulties. It closely resembles relapsing fever, acute yellow atrophy and, in mild cases, catarrhal jaundice. The similarity between yellow fever and spirochætal jaundice is most marked. In each the onset is sudden there is a secondary rise of temperature following an afebrile period and there is a tendency toward hæmorrhage. The greater severity of the symptoms in yellow fever, its more pronounced renal symptoms and its epidemicity are the chief points of distinction. The recognition of Weil's disease apart from the clinical history rests upon the demonstration of the spirochætes. This may be accomplished early in the disease either by guinea pig inoculation with the patient's blood or by the finding of the spirochætes in the blood. In the later stages they may be demonstrated in the urine by dark field illumination or by guinea pig inoculation. An additional diagnostic test is available in the presence of agglutinins in the blood sera of convalescent patients[67] and also in the cerebro-spinal fluid.[68]

The treatment of Weil's disease is prophylactic. Ido, Hoki *et alü*[69] state that they have twice prevented the occurrence of epidemics by disinfection of the ground and by pumping of the coal mines. By proper sanitation and drying of the ground as well as treating it with lime, outbreaks may be aborted. The extermination of rats in a district has been suggested as an alternative measure, but so far no report of its accomplishment has been published. It is, of course, evident that the urine of those suffering from the disease should be disinfected to prevent further spread of the infection. Serum therapy has been used by the Japanese. Inada *et alü*[70] have been able to produce immune serum in horses and have had considerable success in cases treated by this method. Immune bodies have been demonstrated in the blood of rabbits five minutes after intravenous injection of the serum[71] and in the human cases they found that the development of antibodies was promoted and the number of spirochætes within the organs was reduced.[72] They report that the intravenous serotherapy reduced the mortality in their cases from 30.6 to 11.4 per cent. The serum treatment must, however, be given early. Noguchi[73] recommends inoculation with a polyvalent vaccine prepared from the various strains of this spirochæte. Arsenical compounds have been tried but without good result. Indeed Vanni[74] reports the instance of a man treated with neo-arsphenamine who was probably injured by it, as might be expected in view of the fact that the liver is already suffering a considerable amount of damage. For the rest the treatment must be symptomatic with a view to supporting the strength of the patient.

Apart from the bile-staining which is associated with all forms of jaundice the more important lesions are those present in the kidneys, liver, and the muscles, together with scattered hæmorrhagic spots. Briefly, there is universal jaundice with hæmorrhages. There is marked hæmorrhage, both old and recent, into the lungs—this is particularly true in the guinea pig but not so marked in the human. The sputum in some instances is tinged with blood and the occurrence of spirochætes in such sputum has been reported by Basile.[75] The liver is deeply pigmented, quite firm and of normal size. Microscopically the lobules are not clear, the columns are retained but the cells are frequently swollen and dissociated. There may be minute foci or larger areas of necrosis, and a small amount of lymphocytic infiltration.

The kidneys are swollen and their capsule is tensely stretched. The cells of the proximal convoluted tubules are swollen and degenerated or even necrotic. The tubules are filled with a residuum of nuclei and leucocytes. The glomeruli are congested and their cells are degenerated. Spirochætes are found in great numbers within the lumina of the tubules. In some cases there is inter- and intra-tubular infiltration with polymorphonuclear leucocytes.[76] The spleen is seldom found enlarged. The skeletal muscles, particularly those of the calf, present areas of hyaline degeneration and necrosis of the fibres with a surrounding inflammatory infiltration and even giant cells. Occasionally enlargement of the superficial lymph glands occurs.

Since the establishment of the *Leptospira icterohæmorrhagiæ* as the causative agent in Weil's disease, cases have been reported in England,[33, 77 to 79] Scotland,[80] Sweden,[81] France,[18, 36, 82 to 87] Belgium,[16, 17, 88] Holland,[34, 61, 89] Italy,[15, 90, 91] Germany,[30, 92 to 97] United States,[57, 98, 99, 100, 101] and even on the high seas.[102] While epidemics of jaundice have been reported in Canada, notably those recorded by Addison[103] and McKay[104] and a single case by Bird,[105] it is not altogether clear that the disease was the result of a spirochætal infection. It is possible that such epidemics belong to the group of true epidemic catarrhal jaundice[7] of which the etiology is not yet established. A search of the literature reveals no previous case in Canada in which the *Leptospira icterohæmorrhagiæ* was demonstrated.

The following report of a case of so-called Weil's disease which came to autopsy should prove of interest and establish definitely the occurrence of *Leptospirosis icterohæmorrhagica* in Canada.

A male aged forty-eight years was admitted to the Toronto General Hospital on November 9, 1925, complaining of pain in the right side, and weakness.

History of present illness.—The patient was quite well until eight months prior to admission when he had an indefinite pain in the right upper quadrant and jaundice which lasted for two weeks. He returned to work but continued to have occasional pain in the right side. Five months later he was admitted to another hospital on this account, but no diagnosis was reached.

One week before his admission to the Toronto General Hospital he had pains all over his body and a feeling of weakness. Two days later he had a violent chill followed by profuse sweating. In another three days—the fifth day of his illness—he became jaundiced. On the seventh day he had severe pain in the right chest and upon admission to hospital he stated that he had vomited some black material. He had had no cough or expectoration. His appetite was good. He had had some difficulty in micturition since the present illness but had never passed any blood in the urine.

Past illnesses.—Not elicited. (He spoke English poorly).

Personal history.—The patient was born in Malta, had lived in Canada fourteen years and was employed at an abattoir in this city.

Physical examination.—The individual was well nourished, intensely jaundiced and appeared listless and toxic. A few small petechiæ were present on the forehead, on the nose, and beneath the gums. The conjunctival vessels were congested. The teeth and gums were in a dirty condition and the pharynx was injected. There was moderate dullness over the right chest anteriorly with fine moist râles on inspiration. Similar râles were heard over both bases posteriorly. The cardiovascular system was normal. The abdomen was slightly rounded. The liver was just palpable at the costal margin and there was no tenderness in the region of the gall bladder. The spleen and the kidneys were not palpable. Rectal examination was negative.

Provisional diagnosis:

I. Resolving pneumonia (right lower lobe).
II. Subacute yellow atrophy of the liver or subacute hepatitis.

Progress notes.—The temperature was normal for the week following admission, but in the third week of the disease it rose to 103° and was intermittent in type. The pulse varied from 90 to 130, and respirations ranged from 24 to 30. The urine showed a trace of albumin, and no blood cells. It was positive for bile but urobilin was not present. Red blood cells 5,376,000; hæmoglobin 94 per cent; white blood cells 16,600. A differential smear showed normal red blood cells. The white blood cells showed marked toxic degeneration. Polymorphonuclear leucocytes 79 per cent; endothelials 8 per cent; lymphocytes 12 per cent; eosmophiles 1 per cent. Van den Bergh was strongly positive both direct and indirect, the latter giving a reading of 60 units. The non-protein nitrogen was 187 grms., creatinine 6.9 grms. and urea nitrogen 140 grms. Fibrinogen in plasma 0.193 per cent. Fragility of red blood cells, hæmolysis began at 0.375 and was complete at 0.250. The blood calcium was 8.8 mg., and the blood chlorides 0.396 per cent. Examination of the stools was negative for bile, but the benzidine test showed the presence of blood.

The individual became more lethargic and the jaundice grew deeper. He coughed up small amounts of red currant jelly sputum and appeared very toxic. The liver decreased in size, the left lobe more than the right, but the latter receded to 2.5 cm. above the costal margin. The jaundice diminished somewhat, the van den Bergh falling from 60 to 38.5 units on the twelfth day of the disease. He appeared to be progressing satisfactorily, but on the twenty-first day of the disease he had a chill which lasted for three hours, following which he became exceedingly weak. He died two days later.

At autopsy the following anatomical diagnosis was made: *Acute infectious jaundice (Weil's Disease)*.

1. Acute hepatitis.
2. Necrosis of liver.
3. Icterus.
4. Acute parenchymatous degeneration of kidney.
5. Acute suppurative nephritis.

The body was that of a well nourished individual with a very intense yellow tint of the scleræ and skin surfaces. The conjunctival vessels were injected and prominent. The superficial lymph nodes were not enlarged.

Only an abbreviated abdominal incision was made, as consent for the necropsy was given with reluctance.

The abdominal fat was of a deep yellow colour. The peritoneum was smooth and glistening. The urinary bladder was distended, reaching as high as the level of the umbilicus. The liver did not reach the costal margin in the right mid-clavicular line, but lay 2 cm. above it. No adhesions were felt within the abdominal cavity.

The liver was of usual size weighing 1578 grms. and measuring 19 x 13.5 x 9.5 cm. It was normal in contour except that the left lobe was unusually small. The capsule was thin, smooth and glistening. The liver was extremely flabby in consistency. Several blotchy areas of hæmorrhage were seen beneath the capsule. The cut surface had a peculiar yellowish tint. The right lobe was of a pale yellowish-brown colour and the lobular markings were not distinct. The cut surface was dull and dry and showed a fine dimpling due to a bulging up of the parenchymal tissues. The cut surface of the left lobe was dark reddish-brown in colour and was slightly concave, being depressed below the cut margin of the capsule. There appeared to be a decrease in the amount of liver substance in this lobe.

The spleen was slightly enlarged measuring 14.5 x 8 x 5 cm., and was very flabby in consistency. The capsule was thin and finely wrinkled. The cut surface was pinkish-red in colour and the splenic pulp was increased in amount.

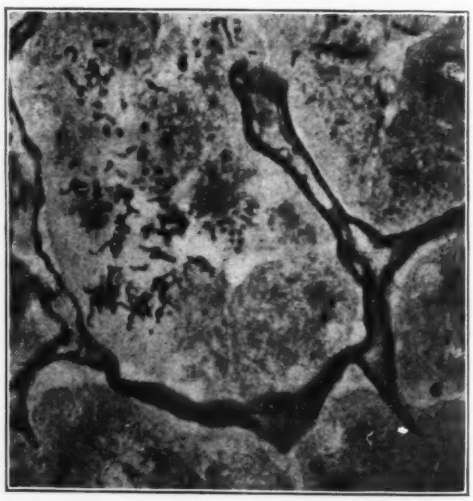
The right kidney weighed 275 grms. and measured 15.5 x 8 x 3.2 cm. The capsule was thin and stripped readily leaving a smooth glistening surface. The cut surface presented a peculiar appearance. The cortex was broad, measuring 7 mm. in diameter, and presented a moderate contrast to the medulla. The cortical markings were masked. There were numerous small petechial hæmorrhages, and many minute opaque yellowish flecks-ings scattered throughout the cortical substance which bulged up visibly between the pyramids of the medulla. The whole of the kidney substance had an icteroid tint. The pelvis of the kidney was not enlarged; it was thin-walled and pinkish-grey in colour.

The left kidney was large, soft and flabby and on palpation *in situ* it appeared to be similar to the right kidney.

Microscopic examination: Liver.—The lobular formation was indistinct and the liver cords appeared swollen and jumbled. In some instances the individual liver cells appeared separated from each other and the cord formation was considerably masked. The nuclei throughout the section varied considerably in size and staining qualities and the cell cytoplasm also varied in the intensity of its staining. The central vein areas were, for the most part, marked by an intense congestion of the sinusoids which were widened in these areas, causing compression of the liver cords. In many cases the collections of red blood cells in these areas amounted to small hæmorrhages and there was actual degeneration of the liver cells. One of the sections of liver showed an intense congestion throughout and rather large areas of hæmorrhage, larger than a high-power field, occurred about the central vein areas, only a few stray liver cells appearing amid the red blood cells. The areas of congestion and necrosis were confined mainly to the central vein areas where the liver cells were much compressed and many of them contained yellowish-brown granules of pigment. A number of the liver cells in these areas contained large and small clear fat vacuoles. There was an increased amount of fibrous connective tissue rather rich in collagen fibrils about the portal areas in all sections. This was accompanied by a very slight lymphocytic infiltration. Other sections of liver, stained by Levaditi's method, were repeatedly searched for spirochætes but none were found.

Kidney.—The tubules, particularly those of the proximal convoluted set, showed extensive degeneration in all parts of the section. The tubular cells were swollen and fragmented and presented a granular cytoplasm, some of which appeared to have broken through the cell membranes and to lie within the lumina. The majority of the nuclei were pale-staining. Some of them had entirely disappeared. A number of the distal convoluted and collecting tubules contained cellular casts or groups of polymorphonuclear leucocytes. A few of them were filled with a greenish-brown, solid looking material. In some instances the glomeruli showed an increased number of polymorphonuclear leucocytes within their capillary tufts and also local collections of polymorphonuclear leucocytes lying free within the capsular space. One or two of the glomeruli showed rather large collections of polymorphonuclear leucocytes in the capsular space with a breaking down of Bowman's capsule and an infiltration of polymorphonuclear leucocytes in the interstitial tissue surrounding the glomerulus. Throughout the interstitial tissues there were numerous areas of diffuse polymorphonuclear infiltration between the various tubules. In a few parts of the section this collection of polymorphonuclear leucocytes amounted almost to abscess formation, the tubules having disappeared. The collections of polymorphonuclear leucocytes showed a marked tendency to occur in relation to the glomeruli in different parts of the field. The interstitial tissue throughout appeared loose and œdematous and there were a number of small areas of hæmorrhage present. In addition to the suppurative lesions seen, there were also a number of focal areas of lymphocytic infiltration. The blood-vessels throughout the tissue were markedly engorged and red blood cells were also seen within a number of the tubules.

A section of kidney stained by Levaditi's method showed hosts of spirochætes throughout all parts of the section. These spirochætes tended to occur in clumps which were readily picked up under the low-power lens. The spirochætes varied considerably in length, the length of some of them being twice the diameter of a red blood cell. The spirals in the organisms were variable in number and in the steepness of their curves. The organisms were rather coarse in character and tended to occur in clusters lying within the cells of the proximal convoluted tubules or lying within their lumina. No spirochætes were seen in the interstitial tissues between the tubules, but a few were found lying within the glomeruli. These appeared to be contained in the endothelial cells of the capillary tufts.



L. icterohæmorrhagiæ in kidney (Levaditi's stain).

Owing to the restrictions placed upon the performance of the necropsy, it was impossible

to demonstrate the nature of the lesion within the right lung. It did, however, reveal the nature of the disease and it is probable that the physical findings which led to the diagnosis of resolving pneumonia were in reality a result of the not uncommon hæmorrhages into the lungs associated with this disease.

This case was very typical so far as the environment of the individual was concerned. He was employed at an abattoir where he was exposed to the presence of rats. The course of the disease during the fatal attack was also typical, but its intermittent character extending over a period of eight months or more was most unusual. It is a matter of conjecture whether this individual was a carrier of the organism and that the exacerbations represent the lighting up of a latent infection due to some lowering of the general resistance, or whether they represent re-infections sustained upon subsequent exposures. The autopsy findings are as one would expect in the third week of the disease. The liver showed evidence of recent damage but it was not possible to demonstrate the leptospira within it. The abundance of the organisms within the tubules of the kidney seems to substantiate the belief that the kidney harbors them and that they actually may increase in numbers there. These findings would indicate that the organisms must have been present in the urine up to the time of death and it is probable that intraperitoneal inoculation of urine into guinea pigs as recommended by Vanni[106] in all suspicious cases would have established the identity of the disease.

The various diseases accompanied by jaundice comprise a group which offers a perplexing problem in differential diagnosis. Of this group the spirochætal jaundice is the only one of which the etiology now seems clear. Herrman[107] believes that catarrhal jaundice, epidemic jaundice, and infectious jaundice represent a closely related group and suggests that catarrhal jaundice may be caused by an organism related to the *Leptospira icterohæmorrhagiæ*. Though few cases are proven, we strongly suspect that the disease is not such a rarity in Canada as is commonly supposed. Garnier and Reilly[108] state that it is five times as common as acute yellow atrophy of the liver, and that they have come to suspect spirochætosis in every case of febrile jaundice. Certainly no case presenting the general clinical symptoms of acute infectious jaundice should be allowed to pass without a careful search for the leptospira.

Summary

1. A proven case of acute infectious jaundice is reported in Canada.

2. This disease is probably more common here than is generally believed.

3. The mode of infection is not clear, but in the great majority of cases the rat is open to incrimination.

4. Benefit appears to be derived from the early use of immune serum, but apart from this the treatment must be symptomatic.

Before concluding I should like to take this opportunity of expressing my sincere thanks to Professor Klotz for his valuable help in the preparation of this paper, and to Professor Graham who has kindly permitted the use of the clinical records.

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ACUTE CRANIAL-CEREBRAL INJURIES*

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APART from a simple concussion of the brain the most common form of serious head injury that one is called upon to treat is fracture of the skull.

Concussion as an entity, I do not propose to deal with, but wish to bring forward some points in regard to the treatment of fractures of the skull.

Unlike fractures in other parts of the body our main concern is not so much with the bony damage as with the condition of the cranial contents. Here are situated the headquarters of the whole body and what affects the brain affects the life of the individual.

Anatomically, fractures of the skull divide themselves into two classes: (1) fractures of the vault, and (2) fractures of the base. This distinction is not absolute, for the latter are frequently extensions from the former.

Vault fractures are divided into: (1) simple linear fractures without depression; (2) simple depressed fractures; (3) compound fractures without depression; (4) compound depressed fractures. (The depressed fractures are generally comminuted).

Basal fractures are generally linear. They may be multiple, and frequently are compound, extending into the pharynx, nasal cavity, sinuses, or through the petrous portion of the temporal bone into the external auditory canal.

Having regard for the above classification there are certain general principles that must be followed in the treatment of the fractures themselves.

1. The simple linear fractures require no operative interference for the local bone injury.

2. All depressed fractures whether simple or compound must be elevated on account of the irritative effect on the brain, no matter whether they are situated over the sensitive Rolandic

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area or over the so-called silent areas. These cases must be considered as potential epileptics. If left alone some of them will apparently go on to a good recovery but in later months or years will develop epileptic seizures. Once these seizures have developed the damage is done and the chance for benefit by a deferred operation is not at all bright. By elevating all depressed fractures at the beginning, the brain is subjected to the least possible irritation and the unknown number who otherwise would have become epileptics is greatly lessened.

3. In all compound vault fractures the scalp should be shaved over a wide area, the patient anæsthetized, the wound thoroughly cleansed by debridement, and any loose fragments of bone removed. Those that are loose but still attached or partly attached to the pericranium should be replaced. If the dura is not opened it should be left intact but if opened by the fracture it should be closed. The wound in the scalp should be closed and a small soft rubber drain may or may not be used for twenty-four hours. I, personally prefer not to drain, I have found the use of B.I.P. paste very beneficial in keeping down infections in these wounds.

Infection is one great source of danger on account of its easy spread to the perforating blood vessels of the skull and thence to the meninges, setting up brain abscess or a fatal septic meningitis.

Skull fracture cases are brought to us for treatment in one of three conditions: (1) They may be mild cases that go on to a rapid recovery and are anxious to forego their treatment too soon. (2) Cases that are moribund from the start and die within a few hours or a day or two. (3) Those cases clinically placed between classes one and two and about which one should be most concerned. They live long enough to submit to treatment. Some of them react, others go on to a fatal issue after lingering a number of days in unconsciousness. It is about classes one and three that I wish to speak particularly. Class two is hopeless from the start.

Although the mild cases seem to recover quickly, many of them suffer from after effects such as dizziness, headaches, photophobia and mental changes. I will refer to these later. They are the type of case that is dazed or unconscious for a few minutes at the outset but when this passes off they rapidly regain possession of all their senses and go on to an uninterrupted convalescence. It is extremely risky to allow these patients to resume their occupation under two to three weeks. Their treatment should be an initial saline purgation (one ounce of Epsom salts), an ice cap applied to the head and absolute rest for from ten days to two weeks. Those accustomed to manual labour may resume their occupation sooner than those who depend on mental effort. Sufficiently prolonged rest for patients after a fracture of the skull is not sufficiently appreciated. The mortality is low but the after effects are numerous and it is for this reason that I wish to stress the importance of absolute rest, free from any mental or physical effort, for at least two weeks. An x-ray of the skull should be taken in all cases of head injury, firstly, to determine whether a fracture is present, and secondly, to determine the type and extent of the fracture.

The case suffering from the severer type of skull fracture is brought under observation unconscious or greatly dazed. Vomiting frequently occurs with this type. The original shock which occurs with these severe injuries may be still present, as shown by a rapid pulse, subnormal temperature, sweating, and low blood pressure. If present, shock must be treated at once with the usual anti-shock methods. During this period no detailed examination or unnecessary disturbance of the patient should take place.

However, it is my experience that most cases of severe head injuries, except those that are moribund, do not arrive at the hospital in a state of shock.

My routine for these cases is to have a skiagraph made when shock has passed off. The temperature, pulse and respiration are observed every hour, the blood pressure every two hours. A careful physical and neurological examination is made. The latter includes an examination of the eye grounds and a reading of the spinal fluid pressure with the mercury manometer. If this pressure is above normal (8 mm. of mercury) enough fluid is very slowly withdrawn to reduce it to normal, or as close to normal as can be done by removing up to, but not exceeding 25 c.c. of fluid. During the removal

of this fluid the pulse and respiration are carefully watched; if they show any decided change during the operation it is immediately discontinued. If properly carried out lumbar puncture is a safe and may be an extremely beneficial procedure. The information gained of the degree of intracranial pressure is invaluable. In the majority of skull fractures, lumbar puncture yields a blood-stained fluid. At times the fluid may resemble pure blood if considerable hæmorrhage has taken place.

This represents the period of observation. This is of variable duration and may last from one to several days. During this time the original symptoms are noted and their progress carefully watched. Any new symptoms are recorded. By the progress during this period one determines what is the best course to adopt in regard to treatment. It is a routine to apply the ice-cap to the head, give a saline purge, and keep the patient as quiet as possible, using a hypodermic of morphine gr. ¼, if necessary as a sedative.

Certain symptoms have special import. Persistent vomiting is a grave sign. A slow pulse becoming slower signifies medullary pressure. Respiration deep and regular at first becoming irregular and later Cheyne-Stokes signifies an increasing intracranial pressure with medullary paralysis. A slowing pulse rate plus irregular respiration signifies impending medullary failure and death. Medullary pressure is also shown by an increasing systolic pressure when it occurs, but it is my experience that this is not a very constant sign. One or both pupils remaining fixed and reactionless, or a semi-conscious patient passing into coma are grave prognostic signs. The findings in the eye grounds of early cases are not very constant or reliable but occasionally they may be, hence is is always wise to make this examination. A single or double choked disc or marked venous engorgement may with other symptoms turn the balance in favour of operation. In the individual case the temperature on admission means little unless it is extremely high or unduly low, either event offering a poor prognosis. On the other hand, the course that the temperature takes does have a definite meaning. An increasing temperature to 104° F. or over, associated with signs of cerebral decompensation, *viz.*, weak, rapid pulse, Cheyne-Stokes respiration, cyanosis, fixed pupils, dropping systolic pressure, etc., means an extremely rare recovery, while in continued subnormal temperatures the question of shock is paramount. In favourable cases the temperature rises after the period of shock to 102½ or 103 then gradually comes back to normal in the course of the next few days.

I desire to emphasize particularly the value of spinal puncture with a manometer attachment. This is the most accurate means we have of determining the intracranial pressure. If the case is a compound fracture with opening of the dura the spinal fluid under increased pressure will gain egress through the point of the lesion and the manometer reading will be subnormal.

One frequently sees a compound fracture of the skull with severe brain injury admitted to hospital conscious and apparently in a surprisingly good mental condition, whereas another case may be admitted with a simple linear fracture, but unconscious, and showing signs of marked increase of intracranial tension. Although the first case has the severer injury the dura is opened by the fracture and a spontaneous decompression has taken place. The second case has no outlet for the increased pressure, and the brain must absorb this effused fluid but while doing so shows marked pressure effects on the vital centres, with prolonged unconsciousness, elevated temperature, etc. In the milder cases that appear to have a normal and rapid recovery, but suffer from the so-called post-traumatic neurosis with headache, dizziness, and mental changes, one finds in many an increased intracranial pressure, the manometer reading from ten to fifteen mm. of mercury. The withdrawal of sufficient fluid to reduce the pressure to normal often gives instant relief. The puncture may be done one or more times until the pressure remains normal, and when associated with a varying period of complete rest, will frequently return these patients to a normal or nearly normal condition.

Mortality.—The mortality in fractures of the skull is given as ranging between 25 per cent to 60 per cent. Beasley[1] reports a 53 per cent mortality in 1000 cases at the Cook County Hospital Clinic in 1916. Crandon[2] 44 per cent in 530 cases at the Boston City Hospital;

Frazier[3] reports 59 per cent mortality at the Methodist Episcopal Hospital, Philadelphia; Ransohoff[4] 63 per cent to 70 per cent; Mixter[5] of the Massachusetts General Hospital reports 57 per cent mortality before 1911, and from then to 1916, 41 per cent. Sharpe[6] estimated the mortality in the larger New York hospitals between 1900 and 1910 as from 46 per cent to 68 per cent and reports 30.7 deaths in 239 cases personally observed. The mortality at the Winnipeg General Hospital among forty proven fracture cases was 27.5 per cent.

If one inquires into the causes of death in these cases one finds there are chiefly three, *viz.*: shock, meningitis, medullary compression. The rational therapy is, obviously, to appreciate this and treat the patient accordingly.

The treatment of shock is well known and does not differ from that produced by any other cause. But one must treat this condition and this alone, before any attempt is made to deal with the intracranial lesion.

All skull fracture cases demand a period of observation for accurate diagnosis and to determine their treatment. An emergency operation should be a rare occurrence. An immediate operation on a case suffering from shock would only hasten a fatal outcome, and all the physical examination and tests one can use would be of no avail if the patient is not first relieved of this condition.

Meningitis is a complication we can help to avoid by properly caring for exposed wounds, by keeping the nose and ears cleansed by swabbing these cavities with sterilized swabs when the fracture extends into them. These cavities should never be plugged but merely kept clean and allowed to drain. The injection of antiseptics is dangerous and should never be done.

The third cause of death and one that offers a definite line of attack is medullary compression. An increasing intracranial pressure in acute head injuries will eventually affect the medulla, at first stimulating its centres, causing a slow full pulse, deep stertorous breathing and elevated blood pressure. Later, medullary paralysis sets in with an increasing pulse rate, irregular or Cheyne-Stokes breathing and a falling blood pressure. Before these clinical manifestations of the effect of pressure on the medulla are observed, the cause must have been operative for some time, but by the time clinical evidence shows the onset of medullary paralysis the patient is beyond help from any treatment. It is here that lumbar puncture with the manometer is of value as one can obtain by it early evidence of increased pressure on the medulla, and deal with it long before these vital centres are forced to give their clinical evidence. At this time treatment can be beneficial.

From the point of view of lumbar puncture one finds the following types of cases:

(a) Cases of skull fracture with normal pressure and no untoward symptoms. One puncture only is done and no fluid withdrawn.

(b) More severe cases in which there are signs of increased intracranial tension and puncture show a pressure of from 15 to 25 mm. mercury. Following one or more punctures and withdrawal of fluid, the signs of pressure diminish and subsequent punctures show a lessening pressure. This class of case is the one in which the puncture finds its greatest therapeutic use, and I venture to say that as time goes on this class will grow and there will be fewer decompressions done.

(c) Cases similar to the above but where subsequent punctures show stationary or increasing pressure with no improvement in the patient's clinical condition. These are the cases that will, if the therapeutic use of the puncture be persisted in, increase the preceding class. One must, however, decide, after a reasonable trial, if treatment by puncture will ultimately succeed or whether subtemporal decompression should be done. Each case is a law unto itself and must be judged according to its progress. No absolute rule for treatment can be laid down.

(d) Cases where the spinal pressure is normal or only slightly raised and the physical condition of the patient suggests severe intracranial damage. These cases seem to be the result of extensive brain damage and decompression is contraindicated.

In those cases treated therapeutically by means of lumbar puncture, I also administer Epsom salts, in amount from six drachms to one ounce, every four hours by mouth, or two ounces in six ounces of water every three hours per rectum, for its dehydrating effect on the brain.

The causes for the increased intracranial pressure in acute head injuries are several. There may be, and probably is an increase in production. The injury to the brain causes an œdema of this structure, which is at first local but later becomes more general, the intensity depending on the severity of the brain injury. The œdema if at all extensive then sets up a vicious circle. It causes the brain to occupy more space in a closed unexpansible cavity. This diminishes the small channels in which the spinal fluid circulates and causes a slowing in its circulation which is soon shown by a rising

pressure in the spinal canal. Fractures involving the base of the skull are often associated with more or less local hæmorrhage. The pressure from this hæmorrhage may readily obstruct the onward flow of the fluid along the base of the brain and account for a general increase in pressure.

It is for the relief of the above conditions that lumbar puncture is utilized and repeated until such time as the pathological condition has subsided and the normal intracranial circulation re-established.

I have not taken up the question of extradural hæmorrhage. These cases frequently offer difficulties in their diagnosis but when diagnosed operation and not lumbar puncture should be their treatment.

My hope in this paper is to stimulate active treatment of cases of skull fracture with a view to reducing not only the mortality but even more important, the morbidity. I have frequently examined cases of skull fracture for insurance companies and for the compensation board, some months after the injury and found complaints of headache, dizziness, irritability, and insomnia, where the physical examination revealed practically nothing abnormal, but the spinal puncture demonstrated an increased intracranial pressure. The withdrawal of spinal fluid and reduction of pressure gives temporary benefit, but what these patients are suffering from is an attempt of the brain to accommodate itself to a permanent increase of pressure which can only be relieved by lumbar puncture or at times a decompression and prolonged rest. Under suitable treatment at the time of the injury these nervous systems would have made a closer approach to normal than they possibly could by deferred treatment carried out months after the injury has occurred.

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Ice Cream as a Cause of Epidemics.—Under this caption, Frederick W. Fabian contributes an article to the *American Journal of Public Health*, September, 1926. Reference is made to numerous epidemics of typhoid, diphtheria, scarlet fever, etc., traced to ice cream, and to several experimental studies. Temperatures used in freezing and storing ice cream cannot be relied on to destroy all pathogenic bacteria which may have been present in the "mix." He advocates pasteurization of the "mix," the establishment of a bacteriological standard (100,000 colonies per gramme), and regular sanitary inspection of ice cream plants.—W. H . H.

Mead's Method for Preventing Rabies.—"Take ash-coloured ground liver-wort, cleaned, dried and powdered, half an ounce; of black pepper powdered, a quarter of an ounce. Mix these well together, and divide the powder into four doses; one of which must be taken every morning fasting for four mornings successively, in half an English pint of cow's milk warm. After these four doses are taken, the patient must go into the cold bath, or a cold spring or river every morning fasting, for a month; he must be dipped all over, but not stay in (with his head above water) longer than half a minute, if the water be very cold. After this he must go in three times a-week for a fortnight longer. The person must be bled before he begins to use the medicine."

This prescription, which Mead claimed had never failed although he had used it a thousand times, is quoted in William Buchan's *Domestic Medicine* (eighth edition, 1784), with the following comment: "Though we give this prescription on the credit of Dr. Mead, yet we would not advise any person, who has reason to believe that he has been bit by a dog which was really mad, to trust to it alone. Mead was an able physician, but he seems to have been no great philosopher, and was sometimes the dupe of his own credulity."—W. H. H.

ON PATHOLOGICAL CONDITIONS IN THE UPPER RESPIRATORY TRACT, AND THE IMPORTANCE OF THEIR RECOGNITION AND CORRECTION IN CHEST DISABILITIES

By W. J. Brown, M.D., C.M., F.A.C.S.

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ALL physicians are well aware how frequently the common cold, and similar mild acute infections in the nasal passages, extend to pharynx, larynx and trachea, and the larger bronchial tubes, giving rise to cough and the expectoration of secretion. It is therefore not strange that chronic infections in nose and throat are liable to do the same. All recognize the possibility of the extension of infection from the urethra to the prostate, bladder and kidneys. More reasons exist for extension in the respiratory tract, for when infection exists in the upper passages each inhalation spreads a germ laden wave of inhaled air over the lower passages, while at the same time the infection has the tendency to spread directly by extension along the mucous membrane.

The following are the most common pathological conditions in the upper respiratory tract that have in this way a direct influence upon pathological conditions lower down, and therefore have an interest for us to-day.

1. *Deflected septal cartilage,* and *hypertrophied turbinates* cause nasal obstruction, with lack of ventilation, and lack of warmth and moisture in the inhaled air on one or both sides, and as a result of these conditions produce a passive congestion of the mucous membranes, which then may become a hot bed of infective organisms in the nasal cavity. From this focus we are liable to have extension to the nasal sinuses, antra and ethmoidal and frontal sinuses through their ostia. As an associated fact it is nearly always on the obstructed side that we get our first sinus infection, and our first ear infection via the Eustachian tube route.

2. *Chronic infection of the nasal sinuses*: and in discussion of this condition, antra, and ethmoidal and frontal sinuses may be grouped together. In many cases infection in them is apt to be overlooked, and a chronic infection may persist producing a discharge, which the patient becomes accustomed to, and is apt to swallow. This may persist without recognition for years manifesting occasional acute or subacute exacerbations, and may give rise to many symptoms simulating tuberculous infection. It is only when thoroughly investigated from a rhinological standpoint that the real condition is discovered.

Symptoms which should rouse suspicion in these cases are (a) the *winter cough* which comes on with wet and cold weather and is accompanied by a persistent irritation in the throat which lasts for weeks.

(b) Anosmia.—Loss of the sense of smell accompanied by a rhinitis that does not readily clear up is always a suspicious symptom, and demands a thorough investigation of all the sinuses. Oftentimes such sinus infections are offensive to the patient and to nobody else, in contradistinction to the atrophic type of ozæna, which are offensive to everybody else but not to the patient.

(c) *Headache* of a boring type that comes on shortly after rising in the morning and lasts till one or two o'clock, then passes off for the rest of the day to return the same time next morning. This headache is almost pathognomonic of sinus infection and is to be distinguished from the afternoon headache, which is often due to eye strain arising from refractive troubles.

(d) The *presence of pus* in the middle meatus, or on the floor of the nose seen on examination of the nostrils, and the presence of polypi will often guide one to the affected sinuses. An examination by the x-ray with transillumination followed by sinus lavage will prove a great help in deciding the existing condition, and what should be done with it.

3. *Infected tonsils* and *adenoids.* Nearly all cases in which tuberculosis is suspected give a history of recurrent tonsillitis. A great many of them show small but infected tonsils. These may be a source of danger in two ways, (a) direct; we know that such tonsils may act as diphtheria carriers for months, or until removed; why may they not act as carriers of other infections? (b) Indirect; if our focal infection theory is not all wrong surely these are cases in which the general condition must be improved by their removal, and the system relieved from the strain of antagonizing an infection of which it can be easily rid.

Dr. Maurice Fishberg writing in the *Medical Clinics of North America* gives some interesting observations regarding the presence of tonsils in cases of tuberculosis. He points out the freedom of cases of tuberculosis from epidemic tonsillitis and from other epidemic infections. During the epidemic of influenza in 1918 only a small percentage of the patients suffered from tonsillitis as compared with the attendants and nurses. Fishberg claims that in the vast majority of cases of active tuberculosis the prognosis is unfavourable when the tonsils are very small, the mucous membrane of the rhino-pharynx pale and there are no lymphoid follicles in the throat, whereas prognosis is good in tuberculous patients when the tonsils are large, adenoid vegetations are present, and the mucous membrane is congested. Tuberculous patients who contract coryza, tonsillitis and rhino-pharyngitis of epidemic type have a better outlook than those who escape these maladies, when exposed to such infection. He also points out that many of these cases do well in his sanatorium until tonsils and adenoid tissue are removed, when in numerous instances the disease appears to light up and become active again.

4. *Laryngeal conditions.* Certain laryngeal conditions such as papilloma, singer's nodes, etc., must be taken into consideration when dealing with suspected tuberculous conditions in the chest. These are easily recognizable on examination and should be removed and taken care of by local treatment.

As regards *treatment* radical surgery is to be avoided as much as possible even if a second operation should later be deemed necessary. Nature should be given a chance. Nevertheless there are times when nothing but radical surgery can be of any service.

1. A deviated septum and hypertrophied turbinates demand resection under local anæsthesia. This operation gives results as a rule gratifying to patient and surgeon. In any operations on the nose, however, it is wise to always conserve as much of the nasal mucous membrane and turbinates as possible, while still giving relief to the nasal obstruction.

2. In cases of infected sinus, it is sometimes very difficult to decide how to act but the x-ray and a careful examination of the local rhinological conditions may often help the surgeon to arrive at a decision.

In the absence of polypi an effort should be made to thoroughly drain the sinuses. After treatment should consist in lavage with Higginson's syringe, using various douche solutions, such as acriflavine, dibromin, boracic acid, etc. The patient can learn to perform this duty himself twice a day and secure results in cases in which one would hardly have expected that anything short of radical operative interference would have been of service. The author always considers that the presence of polypi renders less likely the obtaining of good results from intranasal drainage alone.

In recent years the surgery of the nose and throat is recognized by all as being very essential in the treatment of chest conditions. Dr. Rist of France writes "that the more one studies the pathology of the lungs and bronchial tubes the more one becomes convinced of the interdependence of all parts of the respiratory tract." Until recent years a great many chronic sinus infections have been overlooked. Although he first published his views on this subject in 1916, his war experience made him very enthusiastic. About 50 per cent of suspected tuberculous conditions in chests were able to return to the front line after the nose and throat had received attention. These observations were confirmed by Professor Sergent of France and Dr. Gerald Webb of the United States Army. A *questionnaire* was sent round by the Department of Civil Service Re-establishment as to whether in their experience operative treatment in chronic nasal infection assists in obtaining an arrest of pulmonary tuberculosis, and whether it prevents relapse in

arrested cases. To this questionnaire an affirmative answer was received from seventeen, and a negative from only six.

The outstanding facts to be learned in this connection are as follows. First, a normal nose, throat and upper respiratory tract is the best preventive to diseases of the lower respiratory tract. To obtain this normal condition as far as possible we must remove any infections existing therein by whatever means may be deemed most advisable.

2. Dr. Jabez Elliot writes "No examination of a chest with suspected tuberculosis is complete without a thorough nose and throat examination. Many cases seen with symptoms of chest trouble such as cough, apical consolidation, patches, râles, debility, and the presence of increased temperature, clear up after the removal of the tonsils and adenoids, with the re-establishment of drainage for infective sinuses, the removal of polypi, and whatever else may be needed to rid infection existing in the upper respiratory tract.

Rist in the *Brit. M. J.*, October, 1922, in the opening paper in the tuberculous section, said: "When one has had one's attention drawn to this connection between infections of the upper respiratory organs with chronic coughs and occasional signs of disseminated or localized bronchitis, it is surprising how often the draining of an antrum, the removal of a hypertrophied turbinate, and the removal of hypertrophied tonsils and adenoids puts an end to a long story of apical catarrh, suspicious bronchitis, or incipient tuberculosis. When we recognize an infected condition in nose and throat which we are able to eliminate and we know that this infected condition may cause cough with expectoration, loss of weight, afternoon temperature, fatigue on rising, headache and digestive disturbances, it seems most reasonable that this elimination should be undertaken with as little general disturbance as possible, avoiding radical measures and conserving as much of nature's original groundwork as is at all feasible. The following are a few case reports presented as illustrative of the several points emphasized in my brief paper:

Case 2294.—Patient came under observation in June, 1926, when there was considerable chronic bronchitis and emphysema and suggestive x-ray findings of minimal pulmonary tuberculosis. There was a history of frequent chest colds each fall and winter. There was much hoarseness, cough and expectoration and persistent elevation of temperature 99°-99.2.°

In August an intranasal antrum drainage (bilateral) was instituted. Following the operation the persistent elevation of temperature subsided—cough and expectoration much improved. The month following the operation he gained eight pounds in weight and he has continued to gain. Much of the basal moisture present before the operation has disappeared.

Case 1923.—While in the army he reported sick on several occasions complaining of weakness, palpitation and dizzy spells on exertion. He was finally discharged from the army with a diagnosis of D.A.H. These symptoms persisted, becoming aggravated in June, 1924, when there was also considerable cough and expectoration and a persistent elevation of temperature of 99 to 99.4 degrees.

Physical examination and x-ray in this case revealed definite parenchymatous lesions in both upper chests, also a hypertrophied middle turbinate left, and septal spur left. These were corrected on August 28, 1924, when immediately his persistent elevation of temperature subsided and he began to gain in weight. Prior to the operation there was a gradual loss of weight. The tuberculous lesions became quiescent and he was discharged in June, 1925.

Case 2149.—Patient came under observation in September, 1925, when a diagnosis of chronic bronchitis and nasal sinus disease was made. He was gassed in 1916; in hospital seven months at this time. Cough and sputum have persisted since; also complained of weakness and marked dyspnœa on exertion, and constant severe frontal headaches.

Examination reveals tenderness on pressure over the frontal sinuses and antra and they were opaque on transillumination. There was hypertrophy and inflammation of the tonsillar tissue and the adenoids. In October the tonsils and adenoids were removed and simple intranasal drainage of the antra was effected. Following the operation the ounce of muco purulent expectoration he had had in twenty-four hours, gradually subsided; the persistent elevation of temperature of 99 plus also subsided.

He is continuing to improve and there was a gain in weight of five pounds in the first month following operation.

Case 1885.—Patient came under observation in April, 1924, when a diagnosis of pulmonary tuberculosis and chronic sinusitis was made. He complained of lack of strength and chest pain. There was an ounce of muco-purulent expectoration and he gave a history of susceptibility to colds. He ran a persistent temperature of 99.2 to 99.4 degrees.

Physical examination revealed nasal septum slightly to the right. Left middle turbinate hypertrophied. Antra did not transilluminate. There was impairment of resonance in the right chest from the apex to the third interspace, and posteriorly from the apex to the fifth dorsal spine. In the left base posteriorly a few moist râles were heard following cough.

X-ray findings in the upper lobes bilaterally were strongly suggestive of tuberculous disease. In May, 1924, simple intranasal antrum drainage was instituted and the left middle turbinate was removed. Immediately following this operation the persistent elevation of temperature subsided. He gained from 116 to 126 pounds and the general improvement was marked.

ON SOME OF THE LESS COMMON EARLY SIGNS OF DISSEMINATED SCLEROSIS WITH THE REPORT OF SOME CASES

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DISSEMINATED sclerosis is one of the frequent organic diseases of the nervous system met with in general practice. When a young man or more especially a young woman not beyond thirty years of age presents evidence of early organic nervous disease with an insidious onset, disseminated sclerosis is the first we should endeavour to exclude or to demonstrate. Joseph Collins, of New York, states that syphilis is the most common cause of all organic nervous diseases, and adds that there are few clinical problems more difficult to solve than the distinction between disseminated sclerosis and disseminated cerebro-spinal lesions of syphilitic origin. In some cases the diagnosis cannot in his opinion be satisfactorily made. Cerebral syphilis and disseminated sclerosis both as a rule manifest their presence about the same period of life. They both exhibit a multiplicity of symptoms pointing to an organic lesion. In both, the symptoms are frequently of a transient nature, and the clinical pictures show much variableness at different stages in their evolution. Similar variable symptoms may, however, also be met with in encephalitis lethargica. Transient cranial nerve palsies are common in both disseminated sclerosis and in cerebral syphilis, but changes in the pupils and severe paroxysmal headaches are rare in the former, and nystagmus is rare in the latter.

Not infrequently disseminated sclerosis begins with attacks resembling those of influenza. The temperature is little if at all raised, and the patient complains of a general sense of weakness. This may be accompanied by a transitory loss of vision, or diplopia, or incontinence of urine, or the occasional sudden and momentary giving way of one of the lower limbs, causing the patient to fall without apparent cause. Not infrequently there may be a slight loss of sensation in patches, difficult to find by objective examination. Even sudden attacks of hemiplegia may occur from which the patient may entirely recover in a few days or weeks. Neuralgic pains may be felt, of root distribution, either in the trunk or in the limbs. These early symptoms may completely disappear, only to recur at a later date.

It is characteristic of the disease that its symptoms are so diverse, and so difficult during its early developments to interpret as the precursors of so serious a future. It is important therefore to bear in mind that the following symptoms and signs must be regarded as highly suggestive of beginning disseminated sclerosis; transient disturbance of vision, impaired bladder control, paræsthesia of one or more limbs, diminution of abdominal reflex, loss of tone in the sphincter iridis, giddiness, emotional instability, and temporary loss of power in one or more limbs. In its early stage symptoms indicating organic disease may be latent. A girl happens to knock or strain her arm and finds that she cannot move it. A gentle application of Faradism may relieve what is apparently only a functional disturbance, but if after a few weeks or months there is a recurrence of the trouble, associated with tremor or nystagmus there is unfortunately little doubt that structural changes are present.

Paralysis of the sixth nerve may be one of the initial signs, and optic neuritis may appear early. Dr. James Taylor, writes in the *Lancet*, December 11, 1920, as follows: I think it is now generally recognized that the cause of the pallor of the optic disc in disseminated sclerosis is an antecedent retrobulbar neuritis. There is frequently a history of temporary obscuration of vision, the result doubtless of a patch of inflammation in the nerve behind the eyeball, but it is sometimes impossible to get a history of such temporary obscuration. One must then suppose that the primary affection was very slight and of short duration, but disc pallor supervenes, sometimes on the temporal side only. One may

often meet with extreme disc pallor associated with 6/5 vision, but in contrast to the optic atrophy of tabes, such atrophy never proceeds to blindness. One must, however, remember that optic neuritis may be present in disseminated sclerosis and in rare cases may be the only sign of the disease attracting attention, but it is always well in every such case to be on the watch for an extensor plantar response. In some of these cases a diagnosis of hysteria has been unfortunately made. When therefore a young adult, without a history of lues, maintains definitely that he has seen double, it is wise always to suspect it as a symptom of disseminated sclerosis.

Multiplicity of lesions constitutes one of the cardinal characteristics of disseminated sclerosis; so also do the periodicity of the symptoms. The combination of a marked diminution of the knee jerks with active ankle jerks and a positive Babinsky indicates a multiplicity of lesion and a pathological process in the pyramidal tract as well as a lesion in the reflex arc of the knee jerk.

In any obscure case of chronic disease of the central nervous system the presence of asymmetry in the signs found is also strongly suggestive of insular sclerosis. A spasticity more marked in one lower limb, and ataxia more marked in the other, makes the diagnosis of this disease almost certain. Trauma or shock not infrequently may be the first circumstance to reveal a latent disseminated sclerosis, and when on examination the signs of the disease are found to be present the onset is sometimes spoken of as being acute.

Because the disease in its early stages at least is essentially a lesion of the myelin sheath and not of the axis cylinder, recovery of function is possible. This return of function has led many to wrongfully confound this multiple sclerosis with hysteria because the symptoms come and go. A careful neurological examination in such cases will demonstrate in time the presence of organic lesions during the course of the disease, and with repeated exacerbations the axis cylinder becomes involved in the disease process. When this happens the patient enters upon the stage of chronic invalidism.

In an article entitled "The hysterical element in organic disease", *Lancet*, March 8, 1919, Dr. A. F. Hurst points out that in disseminated sclerosis it is not uncommon to find an extensor plantar reflex, ankle clonus, exaggerated knee jerks, and absent abdominal reflex in a patient who seeks advice for some early signs of disability, such as impaired vision, or unsteadiness of the hands, in spite of the fact that no symptom of paralysis is yet present, thus indicating that organic disease of the pyramidal tract may precede the onset of other symptoms. Hurst believes that many of the early symptoms, at first only temporary, may be hysterical in nature and due to suggestion, and are then curable by psychotherapy. No satisfactory explanation he claims has ever been offered which can adequately explain the remittent character of the symptoms of this disease if they were entirely organic in origin.

If this opinion of Hurst is correct it becomes the duty of physicians to employ psychotherapy in the treatment of the early symptoms, as thereby they may be enabled to do much to alleviate the sufferings of these otherwise hopeless patients, and prevent them falling into the hands of ignorant and irregular practitioners.

In all cases of suspected disseminated sclerosis in which the patient is markedly anæmic, careful examination of the blood should be made lest the case be one of *subacute combined sclerosis* which may simulate disseminated sclerosis in many of its symptoms. In both of these affections ataxic-spastic or spastic paraplegia with exaggeration of the deep reflexes and subjective sensory disturbances are usually prominent spinal cord symptoms. The points of difference between the two conditions are as follows:

The age period at which the two diseases develop is different; whereas disseminated sclerosis rarely develops after the age of thirty-five years, subacute combined sclerosis very rarely develops before the age of thirty-five.

Disseminated sclerosis is more frequent in females while subacute combined sclerosis, often associated with pernicious anæmia, is more common in males (Byron Bramwell).

Disseminated sclerosis is usually a very chronic disease, and in the majority of cases its course is marked by periods of improvement and relapse. Subacute combined paralysis rarely lasts more than six years and its duration is usually considerably less than this.

Disseminated sclerosis is not associated with anæmia except as an accidental occurrence, whereas in the great majority of cases of sub-

acute combined sclerosis profound anæmia is met with in its early stage. The presence of profound anæmia, usually of the pernicious type, with the characteristic spinal symptoms is, in the opinion of Dr. Byron Bramwell, of the greatest diagnostic significance. While ataxic-spastic or spastic paraplegia is common to both diseases in their earlier stages, its development into a flaccid paraplegia with loss of the deep reflexes rarely occurs in disseminated sclerosis, but is a characteristic ending in subacute combined sclerosis.

Objective derangements of sensation are rare in disseminated sclerosis but are common in subacute combined sclerosis, and in this latter disease the sensory symptoms, both subjective and objective, usually present the stocking glove distribution especially in their early stages.

Derangements usually slight of the bladder and rectum are common in the early stages of disseminated sclerosis, whereas such derangements are met with only in the later stages of subacute combined sclerosis, and then are usually severe.

In disseminated sclerosis nystagmus, optic atrophy, volitional tremor and affections of the speech are frequent and characteristic symptoms. These symptoms rarely occur, however, in the subacute combined type of sclerosis. Furthermore according to Dr. Bramwell the lesions in disseminated sclerosis are typically indiscriminate, scattered here and there, haphazard as it were, transversely over the cord, usually at many levels; in subacute combined sclerosis the lesions are greatest in extent in the mid-dorsal region, and involve particularly the posterior column, the crossed and the direct pyramidal tracts, and the direct cerebellar tracts. The grey matter of the cord, the brain, and the cranial nerves are not involved in combined sclerosis but they are liable to be in disseminated sclerosis.

In my own personal experience disseminated sclerosis is one of the commonest organic diseases of the nervous system. More frequently than is generally supposed, it affects the optic nerve, and sometimes rapidly. The attack is often temporary and may be followed by a long intermission. With or without this initial symptom, sensory symptoms, often very indefinite occur; rarely there may be severe pain. It is a most distressing malady not only to the patient but also to the physician, for it comes on without any known cause, affects principally those in the bloom of life, is no respecter of persons, and has a most crippling effect for years before it causes death. Following are a few case reports abstracted out of many:

Case 1.—H. M., aged thirty-three years, female, a stenographer, first consulted me on July 4, 1916.

Complaint.—Loss of power in the left leg; she can go "so far" and then is obliged to sit down because her leg fails her. She is nervous and worried.

History of onset and nature of complaint.—Her trouble started four years ago with a boring pain in the left arm over the lower part of the deltoid muscle. This first came on during the night, awakening her from sleep. The pain was accompanied by a pricking sensation in the fingers of the left hand. It lasted two or three days and then left her and has not returned since. This attack was accompanied by loss of power in both hands and arms so that things were dropped especially if they were heavy, without any sensation of having dropped them. She became unable to operate the typewriter, or to write letters. She therefore, gave up her work and went to Calgary to live with her sisters. Her fingers are still prickling, but the weakness in the left arm is not so marked as is was. She has no pain. In March of this year she noticed that she was obliged to favour the left leg. It did not feel as it should. When going upstairs one day she fell back on her head, but did not become unconscious. She has fallen three or four times but has never hurt herself. She has "sinking spells" and sometimes has "creepy" feelings above the knee.

Examination.—The patient is fairly well nourished, and weighs 100 pounds. Teeth and mouth look healthy. Heart and lungs are normal. She is not constipated and menstruation is regular. The motor power of the left arm is weak throughout. The knee jerk and the Achilles jerk are increased. Abdominal reflexes cannot be elicited. Plantar reflex in the left foot is of the extensor type. Ankle clonus is present on the left side. Superficial pain sense is decreased over the left shoulder. There is no sign of nystagmus, intention tremor or speech disturbance, but the optic discs are pale. The diagnosis was disseminated sclerosis.

Case 2.—Miss F., aged thirty years, was first seen by me December 13, 1918.

Complaints were loss of power in the legs, with incontinence of urine. In November, 1917, she began to have difficulty in getting on the street car, and even in walking along the street. Her awkward gait was quite noticeable to others. The loss of power started first in the left leg. The incontinence of urine began about one month ago, and she also complained of loss of control of the bowels which has developed recently. The power in her legs has improved somewhat during the past three weeks and she has been acquiring some control over the bladder. There is a history, also, of having had double vision for some objects, but this symptom lasted only a short time.

On examination she was seen to be a fairly well nourished woman, but pale, with the teeth in a bad condition. No abnormal condition was found on examination in either chest or abdomen. On examination of the nervous system the following signs were elicited. *Motor system.*—The knee jerks were active, the left markedly increased, abdominal and epigastric reflexes could not be elicited; ankle clonus was marked; extensor plantar reflex was present on both sides. There was no disturbance of ocular muscles.

Sensory system.—Tactile sensation to cottonwool was lost below the level of each breast. Sensation to pinprick was also lost below the same level as well as sensation to moderate degrees of heat and cold. Sen-

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sation to extreme degrees of heat and cold was fairly well retained. Sensation of posture and passive movement was intact. The diagnosis was made of disseminated sclerosis.

Case 3.—Mrs. O., aged thirty-seven years, housekeeper, married, two children, first consulted me March 11, 1915.

Complaint.—Dull pain over lower lumbar spine. She is very nervous. Is troubled with weakness in centre of back when she goes to stoop. She is unable to walk unaided. She has to pull herself around but cannot lift her feet. Left leg is affected more than the right leg. For a short time her left arm and hand have been getting weak, and less powerful, *i.e.*, when she tries to use the left arm it fails her. She sometimes has difficulty in reading; the words run together.

Onset of trouble.—It started four years ago. She was at that time six months pregnant. She took a fainting spell one morning and has been unable to walk properly since then. She has been considerably worse for the past year. In fact for the past year she has not been able to get out at all. There has been definite pain in the back for about two years. The appetite is poor. She is troubled with constipation if she does not take a purgative. If she does take a purgative she loses control over the bowels. Bladder control is normal. Menstruation is regular and normal. She has had no miscarriages. She never has had any serious illness, but has always had good health until four years ago. *Examination* of heart and lungs revealed only normal conditions. Examination of the nervous system: knee jerks were increased and ankle clonus was present, on left side. Babinski's sign was present; but more marked on left side. There was no wasting of muscles of limbs. Sensation to heat was diminished over the inner side of calf of left leg. Sensation to pain (pin prick) touch (cotton wool), and muscular sense (sense of position) were normal, all over the body. Sensation to heat and cold is normal over the rest of the body. There is tenderness over lower lumbar spine when a hot sponge is pressed against it. There is no speech disturbance or intention tremor. Eyes react to light and accommodation. Vision is normal. There is no nystagmus. The x-ray showed no abnormality in the vertebral column. No evidence of any compression of cord. *Diagnosis.*—Disseminated sclerosis of the spinal type.

The patient was admitted to Calgary General Hospital, July, 1920, five years after I first saw her. She had central nystagmus, intention tremor or rather marked ataxia of arms, scanning speech, double ankle clonus, increased knee jerks, extensor plantar reflexes, no abdominal reflexes, complete paraplegia, loss of bladder control, optic atrophy. She was too weak to test sensation. She died in September, 1920.

Case 4.—J. L. S., aged fifty years, rancher. A patient of Dr. Spankie of Calgary, first seen by me January 24, 1916.

Complaint.—Numbness and weakness in left arm.

Onset and nature of trouble.—First felt a slight numbness in end of fingers in May, 1915. It gradually extended up the arm to the shoulder, and for two months he has had the sensation of numbness in the whole arm. Weakness was first noticed about two months ago. There is slight lack of control of the whole arm and of the fingers. He has also noticed on one or two occasions a very slight lack of control of left foot. The numbness runs from the thenar eminences up the radial side of left arm to deltoid region. Otherwise his health is good.

Past history.—He has always been healthy. He denies venereal disease.

Examination.—Sensation to touch, temperature and pain is normal on both sides of body. The muscles of left arm and hand are considerably weaker in their grasp than those of right arm and hand. Knee jerks are much increased. There is no ankle clonus. In the left foot the plantar reflex is of the extensor type, but it is not a definite Babinski. Wassermann reaction negative. *Diagnosis.*—Doubtful; it may be the beginning of insular sclerosis. I saw him one month later and symptoms or signs had not altered. This patient afterwards went to the Mayo Clinic at Rochester where a definite diagnosis was made of disseminated sclerosis.

It will be noticed that the early symptoms observed in these patients were loss of power in a limb or limbs, numbness in the limbs, loss of control over the bladder and staggering gait and double vision. None of the classical signs such as nystagmus, scanning speech or intention tremor were elicited in the examination in the early stages, although they were present in the late stage in one patient.

In the investigation of any case with symptoms or signs pointing to the nervous system, we should first endeavour to locate the seat of the disease. Increased knee jerk, sustained ankle clonus, an extensor plantar reflex, with absence of the abdominal reflex, when they occur together are valuable signs that spell organic disease and also locate the disease in the pyramidal tract.

The *British Medical Journal,* in answer to a correspondent's query whether the "i" in "angina" is long or short, has published a note from Prof. Sikes, of St. John's College, Cambridge, on the subject. The Professor writes: "Scholars have often for the last hundred (or perhaps thousand) years pointed out that the *i* in *angina* is short. This is settled by Plautus, *Trinummus,* II, iv, 139: 'Sues moriuntur angina (hic) ascerrume', and by the end of a hexameter in Lucilius *ap.* Non. 35, 10—' . . . Una angina sustulit hora.' Personally, I have not any views, being accustomed to many scientific words which, as a living wit once remarked, 'are compounded of two languages and one false quantity,' and angina errs only in the latter defect." But there may still be purists who deplore the popular pronunciation on more grounds than one.

BLADDER DYSFUNCTION SECONDARY TO NERVE LESIONS

By Meredith F. Campbell, M.D.

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URINARY tract infection kills two of every three tabetics. This form of infection is somewhat less frequently observed in other types of nerve disease. Bladder disturbances are so commonly associated with organic neuropathies and in most cases so much can be done for the patient urologically, that the urinary apparatus merits strictest attention, not infrequently much more than the primary disease.

Comparatively little is known of the exact physiological nature of the urinary act. Langley and Anderson have shown that the bladder (rabbits, dogs, cats) receives motor fibres from (1) the second to the fifth lumbar nerves reaching the bladder in turn through the sympathetic chain, inferior mesenteric ganglion, hypogastric nerves and plexus, which fibres when stimulated cause contraction followed by inhibition; (2) nervi erigentes and hypogastric plexus from second and third sacral nerves which, when stimulated, empty the bladder; (3) fibres from the sciatic plexus passing through the pudic nerves to the periurethral musculature. The principal motor fibres, then, emanate from the sacral cord. The spinal sensory fibres are in the dorsal roots of the first to fifth sacrals, particularly the second and third.

Probably the most generally accepted theory of the urinary act mechanism is the following (Redfisch): a small urinary accumulation causes stimulation of the bladder sensory nerve endings and produces a reflex contraction of the internal sphincter. A greater accumulation sets up a mild reflex contraction of the bladder musculature proper (detrusor). It is by the spreading upward of these additional stimuli from the lower to the higher centres that the conscious desire to urinate is incited.

In adults urination is an habitual voluntary act consisting of (1) tonus inhibition in the lumbar cord relaxing — inhibiting — the internal sphincter; (2) emptying of the bladder by reflex and voluntary contraction of the detrusor plus aid by the abdominal muscles. The action of the external sphincter is voluntary; of the internal, involuntary, except when the external is damaged.

Considering this extensive, intricate, and highly delicate nervous apparatus with many vulnerable points controlling the bladder, we may more readily understand how a comparatively small lesion either central or peripheral may bring about impaired vesical function. Correct interpretation of the clinical picture presented is often difficult.

Neuropathic bladder disturbances are of three types (1) irritative, (2) sphincteric spasm, (3) sphincteric paralysis or relaxation. During the course of a disease all three conditions may be observed, always in the above order, paralysis being the terminal state. Not infrequently the earliest signs of organic nerve disease are vesical. Particularly is this so with tabes (25 per cent); less so with syringomyelia, multiple sclerosis, neoplasm. In the early stages, vesical neck hyperæsthesia is present with the accompanying frequency, hesitancy, or terminal dribbling.

The so-called irritable bladder is produced reflexly. Bladder neck hyperæsthesia plus various sources of peripheral irritation bring this syndrome into play. These irritative factors are legion. The most commonly found are phimosis, collections of smegma, balanoposthitis, venereal warts, adhesions of the prepuce, urethral stricture, polyps, and adenomata. prostatitis, posterior urethritis (the pars prostatica bears many highly sensitive nerve endings) vulvitis, vaginitis, labial tumours, inflammation of Skene's ducts, tumours of the uterus or cervix, pericystitis, excessive coitus, renal and ureteral lesions, and fistulæ, rectal new growths and helminthiasis. All may produce reflex irritation and must be borne in mind when treating this type of case.

Spasm of the external sphincter is not uncommon in early cord disease and may be so marked that complete retention with overflow ensues. Acute retention is common with tabes. Most of these patients suffer from a chronic retention; this residual ranges from a few cubic centimeters to many ounces.

Paralysis of the sphincters varies from a mild relaxation to total paresis. If there is disjunction of the lower from the higher centres as is seen in transverse myelitis above the lumbar segments or at times in tabes, the so-called automatic bladder obtains. The stimulus of increasing distension produces reflex detrusor contraction with nearly complete emptying.

The following are chief of the neurological syndromes in which bladder disturbances are common: cerebrospinal syphilis either congenital or acquired, most often in the form of tabes dorsalis, cord tumours, multiple and transverse myelitis, paralysis agitans, status postapoplecticus, toxic goitre, syringomyelia, tuberculous meningitis, the toxic neuritides (scarlatina, typhoid, diphtheria, lead, alcohol, etc.) and spina bifida. The latter condition should always be considered when the etiology of bladder disturbance seems undeterminable. Urinary incontinence may follow too prolonged use of the indwelling catheter. Cord changes associated with blood dyscrasia particularly pernicious anæmia have been observed in patients with dysfunctioning bladders.

Diagnosis entails recognition of the underlying nerve lesions. Too often the neurologist and his function are overlooked unless some clinical manifestation as tabetic gait is grossly evident. Space permits no detailed description of these various neuropathies which may cause bladder disturbances. Many of these diseases are well recognized generally. The posterior cord tracts are involved in all save the peripheral neuritides. With posterior tract disease vesical disturbances are the rule sooner or later. Urinary symptoms are essentially the same in all. Let us first mention briefly the less frequently observed lesions and then consider in greater detail tabes dorsalis since tabetic manifestations are typical of, and are rather commonly observed in spinal cord disease.

Tumours of the cord, its membranes, cauda equina, and conus medullaris are seen occasionally. Diagnosis in the presence of constant and severe root pains with associated progressive paralysis and localizing symptoms is not difficult as a rule.

Syringomyelia is due to a gliomatous new growth about the central canal of the cord with cavity formation. Although bladder symptoms are infrequent, vesical analgesia, transitory sensory and motor, either irritative or paralytic, disturbances occur. A combination of an amyotrophic paralysis with retention of tactile and loss of thermal and pain sensation is said to be pathognomonic.

In transverse myelitis whether due to compression or inflammation, if the lumbar cord is involved vesical symptoms are present from the outset. Urinary infection occurs early. The concomitant cystitis is thought by some to be due to disturbed trophic influence. Myelitis in the thoracic region produces variable reflex reactions. Reflexes below the lesion may be abolished first, then become exaggerated, even to spasticity. They may, however, become entirely lost.

Multiple sclerosis is characterized pathologically by patchy areas in brain or cord in which the normal nerve elements are replaced by glia tissue. The etiology is unknown. Familial tendencies are noted. Volitional tremor, scanning speech, and nystagmus are the diagnostic triad directing the diagnosis. Spastic weakness of the legs, varying degrees of optic atrophy, a positive plantar reflex (Babinski sign), and absent abdominal reflexes are also noted. Eighty per cent of these patients suffer bladder disturbances.

With tuberculous meningitis, bladder symptoms are common. Moreover, the appearance of acute urinary retention in a patient ill of tuberculosis is an early forecast of meningeal involvement.

The toxic neuritides may cause bladder disturbances without cord involvement. In severe cases, the wrist and foot drop, congestion of hands and feet with paralysis of the extremities and sphincters are characteristic. The symptomatology varies directly with the severity of the disease. The steppage gait is noteworthy.

Ninety per cent of spinal cord diseases have their origin in syphilis. In the form of gumma or pachymeningitis lues may produce bladder upsets. Tabes strikes hardest. The mutual relation between tabes and urinary disturbances with subsequent infection may be realized when

we consider that three-fourths of all tabetics have bladder symptoms (Erb) and that in one-fourth of these, they are the initial symptoms. Only shooting pains are of greater primary incidence. As already stated, two-thirds die of secondary urinary tract infection.

The diagnosis of tabes is usually easy. The distinctive lightning pains if present, loss of knee jerk and what is probably more important the loss of the ankle jerk (Achilles), various ocular palsies, the Argyll Robertson pupil, the Romberg sign and the characteristic ataxic gait all suggest the diagnosis.

Ranking second in frequency as initial symptoms, vesical disturbances may begin as a urinary leakage on coughing, sneezing, or sudden muscular effort. Hesitancy or terminal dribbling may also appear early. There is hyperæsthesia of the vesical neck with a succeeding spasm of the external sphincter and a variable degree of urinary retention. Paralysis of the internal sphincter and later the external sphincter is the end result. With this is associated bladder musculature degeneration (trophic) producing atony, residuum, and intermittent or continuous dribbling. The clinical course may be described as patchy. A characteristic intermittency and variability prevails. On inspection the genitals are apt to appear atonic. Palpation reveals an atonic rectal sphincter. The rectum is flabby and ballooned.

Cystoscopy may be performed with impunity as a rule. An anæsthetic bladder neck and relaxed internal sphincter render this a relatively painless procedure. After personally performing cystoscopy in a large series of this type of case we have come to the conclusion that the cord bladder presents no characteristic picture. In the early stages a general atony of the bladder wall and trigone is noteworthy, with a rather fine trabeculation of the wall. This is presumably a trophic change. Later trabeculation may be extreme with great saeculation and even true diverticulum formation. Phosphatic calculi are not uncommonly observed late. Cystitis may be marked although it is often surprising how relatively clean the bladder wall may be in the presence of rather foul urine containing much purulent débris. It must be remembered that most of this pus is of renal origin and is secondary to an ascending renal infection through patulous ureter orifices. The orifices are atonic, gaping, and are indurated proportionally to the degree of cystitis and ureteritis. Ureter reflux with back pressure on the kidneys obtains.

Bladder crises are rare and are closely simulated by bladder stone. Especially so when the patient is suffering an acute attack of "fit of the stone," that is when the stone gets down against the sensitive bladder neck. Ill defined contracted bladder neck determinable only by actual digital palpation may cause symptoms indistinguishable from those of advanced nerve lesions. Other obstructive lesions such as hypertrophied prostate and urethral stricture must be ruled out. On the other hand, we have seen prostatectomy performed in cases wherein later, more thorough examination revealed tabes. Hereditary or unrecognized syphilis must be borne in mind always.

The prognosis of this group of cases is uncertain. It is always grave when urinary symptoms and infection appear early in the disease. The patient soon dies of renal infection. Urinary tract or pulmonary infection kills practically all of these patients, the former twice as many as the latter.

The diagnosis made, management and treatment at once become the problem. Whereas the neurologist may or may not succeed in curing the nerve lesion, the urologist can certainly relieve distressing vesical symptoms, prolong life and render it more enjoyable to those patients presenting uropathic complications. The objectives are: to inspire confidence in the patient, to keep the bladder clean, to postpone infection, to reduce residuum and infection if present, to relieve symptoms and if necessary to re-educate the urinary mechanism. The course of treatment herein outlined applies to all cord lesion cases, particularly tabes. The peripheral neuritides are treated in like manner but here the conditions are usually transitory.

After the diagnosis is established and the urine examined, it is well to begin at once the administration of a urinary antiseptic. Urotropin ten to fifteen grains three times a day is perhaps the best. Enough acid sodium phosphate must be given to keep the urine well acidified; thirty to forty grains a day usually suffice. It must be remembered, however, that there is great tendency to urinary

decomposition with alkalinization in these cases and the urine must be kept acid to litmus if benefit is to be derived from urotropin. Furthermore, urotropin is of benefit only where there is residual urine whether in the bladder, kidney or ureter.

When the patient has been taking urotropin for one or two days, he empties his bladder, a catheter is passed and the residuum determined. Asepsis is imperative as infection is particularly frequent following instrumentation because of trophic disturbances. About half of these bladders are already infected. A residuum will be found in three-fourths and is often present long before subjective symptoms are noted.

If this residuum is less than three ounces, catheterization twice a week will suffice, if under five ounces, every two days; if more, every day, or a better rule often enough to prevent bladder distension, every eight hours in cases of acute retention. Always empty the bladder slowly. At the end of catheterization the bladder is washed out with an antiseptic solution. We prefer acriflavin 1:5000 in the mild cases or silver nitrate of the same dilution in more advanced cases. A small amount may be left in the bladder before withdrawing the catheter. The inorganic silver displays a certain tonic action in the bladder and hence is preferable to the organic preparations as argyrol, etc. By this course of treatment the residuum is gradually reduced through affording relief to the detrusor from the strain of accumulated urine. In the absence of infection but presence of residuum urotropin must be continued, (about twenty grains a day). In the presence of infection, it must be given without remission (except for grave contra-indications) forty to fifty grains a day.

We have recently seen a case of so-called automatic bladder, the viscus periodically emptying itself of about twelve ounces of clear sparkling sterile urine. This is rare and the insertion of a catheter in such a patient with a well functioning automatic bladder would unquestionably set up an infection materially hastening death. Such a patient is much better left alone until signs of urinary infection are evident.

A periodical examination of the urine is of utmost importance and value. It is well said that the reaction of the urine (in tabes) is of greater import than the Wassermann reaction of the blood. Copious water intake, a minimum of 2500 c.c. a day is advised. With this quantity it is not difficult for the patient to urinate every two hours regularly during waking hours. This not only forms an essential habit but eliminates considerable infectious material. Under no condition should the bladder become distended.

Remaining sphincter tone may be encouraged and stimulated by mild dilatation—the Kolmann instrument or better, sounds. Spasm of the external sphincter is best relieved by the cold sound. In severe cases, atropin is indicated.

As previously remarked, sources of irritation producing reflex disturbances should be eliminated. This entails a complete urological examination including cystoscopy and rectal investigation. A small meatus, urethral stricture or chronic prostatitis should be eradicated.

While the infection is being combated and residuum reduced, re-education of the bladder mechanism is instituted. Particularly in tabetics may this control be lost. As is well known, much has been accomplished in the restoration of co-ordination of the extremities in tabes and much hope may be offered the patient with an uncontrollable bladder. Although degenerated nerves cannot be restored, the patient may be taught to utilize the imperfect mechanism remaining and to put into operation a new mechanism of muscles and nerves to replace those functionally lost to him.

This re-education is that practised by prostatics following prostatectomy when sphincter control may be temporarily lost. The bladder is filled and the patient ordered to void. Suddenly he is commanded to stop. Too frequently the early attempts seem quite hopeless but gradually the exercise becomes fruitful and eventually he becomes able to start and stop his stream voluntarily. He practises starting and stopping of urination at each voiding several times. It is amazing how rapidly many of these patients acquire a new control.

The underlying cause of the cord condition must be treated. In the treatment of lues great care should be exercised that the treatment of the late stages be not too intensive as compared with that of early syphilis. Some

have reported good results with tryparsamide. Mercurialized serum intraspinally has given excellent results in some cases.

The management and treatment of these patients demands most strict attention to detail but offers great relief to those suffering from a chronic disease which often entails much misery and is associated with an exceedingly high mortality. Many can be restored to a useful life.

THE MORTALITY IN APPENDICITIS*

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By A. E. Archer, M.B., F.A.C.S., and M. A. R. Young, M.D., C.M.

LINCOLN in discussing acute suppurative appendicitis before this society a year ago presented figures which set us investigating our own results more closely. This discussion is based upon these findings. His reports are from the results obtained by a group of surgeons working more or less independently, ours are those of a group working as a unit under what might be termed a controlled technique.

From reading the literature of the past year or so, it is evident that the problem confronting the surgeon in dealing with appendicitis is not by any means solved. That the death rate as a result of a diseased appendix is increasing instead of decreasing, at the present time, is a fact that should demand serious thought on the part of all who attempt to deal with the appendix in its many moods and fancies.

Willis[1] gives some startling figures and calls attention to two apparent facts upon which he suggests that the increase in mortality may be based. First, the attitude of the public in considering such conditions as appendicitis, ulcer, and gall bladder trouble, as everyday events to be treated casually; and secondly, the readiness with which the poorly trained operator attempts to deal with these conditions. We might add a third, the readiness with which the average patient places himself in the hands of the above mentioned operator.

Warnshuis[2] states that the apparent average mortality in acute appendicitis is 4.23 per cent and that of chronic appendicitis 1.68 per cent. The mortality in over eleven thousand cases of acute and chronic appendicitis was 2.9 per cent, roughly three cases in every hundred. Furthermore only nine hospitals out of thirty-four reported, had a death rate of three per cent or less.

Gatch and Durman[3] report a mortality of 7.2 per cent and Deaver and Magoun[4] one of 5.9 per cent. These reports are comparatively recent and from men of the highest standing.

In this province, Lincoln[5] reported that the mortality in the city of Calgary for the preceding year was 8 per cent in the acute cases, and stated that he thought it safe to assume that there was a mortality rate of 16 per cent in the perforated cases alone. In the discussion which followed we were much impressed by the wide divergence of opinion as to the proper pre- and post-operative treatment. The question arose in our minds as to the possibility of this being an explanation of the seemingly high mortality. After analyzing our own results in 245 consecutive cases done by the same group and operated upon since, we have adopted a fairly definite method of pre- and post-operative treatment, we felt the matter of sufficient importance to justify our bringing it to the attention of the Association again this year.

We are of the opinion that the pre-operative and the post-operative treatment in all cases of appendicitis is of prime importance. So much so that we would feel like placing the skill of the surgeon as a secondary consideration once a definite diagnosis has been established. The routine practised in our hospital developed gradually and reached its present form over two years ago, since which time little if any change has been made.

The following group of cases while not large comprises all the types commonly met with and

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*Read before the Alberta Medical Association, September 8, 1926, Edmonton, Alberta.

the usual percentage of those cases which are atypical. They have all been done since we adopted the above mentioned uniform technique.

Due to the fact that the major part of the clientele of this hospital is foreign born and does not follow advice satisfactorily, it has been the practice to operate upon all cases in which there was evident trouble in the appendix. Thus the subacute case frequently comes to operation instead of undergoing expectant treatment. Since the beginning of the present series three cases who were admitted to the hospital with appendicitis and for whom operation had been advised refused operation and an attempt was made to treat them expectantly. Two left the hospital before the condition had subsided; in the third, an old lady, nature was kind and allowed her abscess to perforate the cæcum and drain. She had an uneventful recovery and left the hospital well.

The following is a grouping of the 245 cases of the present series:—

	No. of Operations	*Deaths*	*Average stay in hospital*
Acute, non-perforated	61	0	14.5
Acute, perforated with local peritonitis including pelvic	53	0	17.3
Perforated, general peritonitis	19	2	43.3
Subacute	50	0	15.7
Interval operations	62	1	17.7

No. of cases operated upon	245
No. of deaths	3
Percentage mortality	1.22
Average stay in hospital	21.7 days

Thirteen cases not included in the average stay in the hospital who had some complication such as phlebitis, diabetes, tuberculosis or peritonitis, but who recovered and left the hospital, had an average stay of 48 days.

Of the three deaths reported, two were children who had been sick for over a week before admission with general peritonitis. They succumbed to the toxæmia of the condition several days after operation in each case. The death in the chronic column was that of a stout woman thirty-five years of age whose death appeared to be due to a low grade pneumonia. Death occurred on the eighth day. There was no autopsy. Since the last fatal case, 161 appendectomies have been performed without a death.

By referring to the figures above you will find no mortality among the acute non-perforated cases numbering sixty-one, and a 2.78 per cent mortality among seventy-two perforated cases. We realize that the difference in the mortality percentage here stated and the one we were considering last year, referred to at the beginning of this article, may in part be due to the comparatively small number of cases which we are reporting. As we are enthusiastic over the apparently satisfactory results in our series we feel free to present this report and outline our treatment in some detail in the hopes that it may result in a discussion which may be mutually helpful.

The technique which we employ in the treatment of appendicitis is as follows:—

Pre-operative.—After admission the acute case receives a bed bath and a soapsuds enema if the bowels have not moved recently. In severe perforated cases, especially in children, operation is often postponed for a few hours, during which time the patient receives glucose and Ringer's solution interstitially or glucose and sodium bicarbonate intravenously. The next step in the preparation of either the acute or the perforated case is to dry shave the site of operation and to paint it with picric acid solution. Twenty minutes before going to the operating room the patient receives a sedative by hypodermic injection. For routine use we have found the hyoscine morphine cactoid compound to be the most satisfactory to us. The adult dose is eight to ten milligrams. In children in which the appendix is perforated the pre-operative sedative is used with great care, a small dose of morphine and atropine, or atropine alone is given, occasionally nothing at all. The value of the pre-operative sedative in cases other than those mentioned needs no discussion. In the operating room the abdomen is again painted with picric acid solution before the draping is done.

The routine for the subacute or interval case is as follows. Tincture of digitalis is given to the extent of 4 or 4 c.c. daily, and sodium bicarbonate 5 grm. daily in the adult case. This is carried out for one to three days, depending on the time the patient has to wait before operation. On the evening before operation the patient receives a soapsuds enema and a thorough preparation of the site. If the patient does not settle for the night some hypnotic is used, usually veronal. This treatment coupled with a restricted diet and fluids forced to at least 2,000 c.c. daily in the adult case, brings the

average patient to operation as a good surgical risk.

Operative technique.—With the exception of those chronic cases in which we wish to explore the upper abdomen, or in women the pelvis, the muscle splitting incision in the McBurney region is used. In the acute or perforated case the exact site varies a good deal, as the incision is placed over the point of maximum tenderness or over the mass if there is one palpable. If this care is taken in these cases what might otherwise be a difficult procedure is often rendered comparatively easy. It should be emphasized that the routine use of the so-called McBurney incision reduces bowel trauma to a minimum; usually the small bowel does not appear in the wound at all. This, we think, is important. The amount of traction is also small, and in drainage cases the potentialities of post-operative hernia are reduced to a minimum.

In cases where the appendix has perforated the pus is aspirated, the appendix where possible removed and the stump invaginated. In this series the appendix was removed in every case. Cigarette drains and occasionally rubber tubes are left in for drainage.

Our routine anæsthetic is ether; nitrous oxide and oxygen are used occasionally, and novocain alone in a few cases when the appendix is removed under local anæsthesia.

Post-operative.— The patient returns to a warm bed where he is placed in Fowler's position immediately. This position is maintained until well on in convalescence. Immediately on his return to bed he receives interstitially, usually into the antero-lateral aspect of the thighs, a litre or a litre and a half, depending on the size of the patient, of isotonic salt solution. To this solution is added 30 c.c. of a 1 per cent novocain solution which renders the injection painless even though the patient be conscious. This method of giving interstitial injections was first seen in use by the Crile Clinic. The solutions used are Ringer's in the average cases; a mixture of Ringer's and 5 per cent glucose in the more complicated ones. In the severe complicated cases intravenous therapy is used, and if indicated sodium bicarbonate 1.7 per cent is employed with the glucose mentioned above. If the amount of glucose is above 200 c.c. of solution a corresponding amount of insulin is given. We use the above interstitial therapy as a part of our routine after all major operations.

By hypodermic injection the patient gets some stimulant such as strychnine or the compound of strychnine and digitalin at three hour intervals for the first twelve or twenty-four hours. The dosage of the drugs mentioned is one milligram. If the patient's condition is good and there is no nausea the hypodermic medication is discontinued on the day following operation. Strychnine is still given by mouth in the tablet form or in fifteen minim doses of tincture of nux vomica. On the third day in the uncomplicated cases aromatic cascara is added to the tincture of nux vomica and the patient gets fifteen minims of each as a tonic before meals. This mixture also keeps the bowels moving better than the occasional stronger purgatives. For the patient's comfort after the operation small doses of morphine are used. This drug is used sparingly, the usual adult dose being eight milligrams. Lately we have been giving it with magnesium sulphate which increases and prolongs the effects of the morphine. The total amount of morphine given to an adult is rarely over sixteen milligrams and this is given in eight milligram doses.

Fluids are allowed as soon as signs of nausea are absent and this is usually early. They are forced to the extent of 2000 c.c. on the second and 3000 c.c. on the third day in the adult case. Fluids are forced to this extent throughout convalescence. The patient usually gets nourishing fluids on the second day and soft diet on the fourth day. Since employing the interstitial technique the amount of nausea, vomiting, distension, catheterization, and extreme thirst has fallen almost 75 per cent according to our figures. Distension sufficient to require eserine and pituitrin occurred in two cases out of the last 100 appendectomies. Approximately the same figures were obtained over a year ago in a series of 100 cases checked for this condition. Of the value of interstitial injections in all cases we are absolutely convinced.

In uncomplicated cases in which the post-operative course is smooth, the patient receives a soapsuds enema on the morning of the third day and after that a mild laxative as is necessary. If distension occurs or the patient is uncomfortable because the bowels have not moved, an enema, or pituitrin, or eserine and pituitrin

followed by an enema is given to obtain relief. This treatment is used, if indicated, after the first twenty-four hours but not before.

We realize this method of treatment is not the time honoured treatment of Ochsner, but our results have been such that we believe it is justified. Furthermore there has not been a case in this series whose condition has been rendered worse, so far as we could judge, by employing methods opposed to those of physiological rest. At present we would not feel justified in altering this technique unless clearly better results could be shown to be obtained by some other method.

This is the routine we employ and it has been carried out in every case reported. We lay stress on the importance of this pre- and post-operative treatment as an important means of reducing the high mortality in dealing surgically with the diseased appendix. We would also again call attention to the point mentioned in the beginning of this article, that both the laity and the average medical man are often too ready to refer to the diseased appendix in all its phases as "just an appendix" when it may be one of the most serious operations that a patient is called upon to face.

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THE POTENCY OF TINCTURES OF DIGITALIS AND STROPHANTHUS

A DISCUSSION

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DURING the early part of the present year (April, 1926, vol. xvi) a paper was published by the writer in the *Canadian Medical Association Journal* entitled, "The potency of tinctures of digitalis and strophanthus purchased at various points on the Canadian market."

The publication of this article has caused considerable discussion, some of it commendatory and some adverse. This discussion assumed the forms of an editorial, a published letter, private correspondence and conversation. The discussion has come from university and hospital appointees, from manufacturers and manufacturers' agents and from representatives of other government laboratories doing similar work.

Unfortunately, more was taken out of the article than was intended; and therefore inferences were drawn that the published data did not warrant. One error arose from interpreting the phrase "manufacturers in Canada" as meaning "Canadian manufacturers", whereas the intent of the author was "Manufacturers selling in Canada", whether manufacturing in Great Britain, Canada, United States or elsewhere. Some would like the publication of the manufacturers' names. This however is not possible, as it is contrary to the policy and regulations of the department. Others have appreciated the difficulties in publishing work of this kind and have realized the object that it was desired to attain. The article attempted to cover a considerable amount of ground and compress within a small space as general a résumé as possible, without any great detail, and to show from the two tables how reliable the tinctures of digitalis and strophanthus might be.

However, aside from such criticisms, it is believed that the paper has been very successful in arousing interest in the question of the potency of these drugs. It is therefore proposed in this article to give more extended data than previously published and to show what conclusions can be justly drawn from them.

Collection of samples.—The samples were collected by the inspectors of the Department of Health of Canada in various cities throughout

the Dominion of Canada. These inspectors purchased over the counter of the local drug stores, samples of tinctures of digitalis and strophanthus in quantities of one, two and four fluid ounces. As many different kinds as were available in that locality were purchased. Some of these samples were obtained in the original containers and some were rebottled by the local druggist.

Of those samples that had been rebottled by the local druggist and labelled as being the product of some manufacturer, many may have been on his shelf for two or three years and were being dispensed long past the date recommended by the manufacturer. Results of these assays would not of course, indicate the *original* value of the product of that particular firm.

The object in thus collecting the samples was to obtain a knowledge of the potency of these tinctures as they were *dispensed at the local drug stores.* There was no intention in the survey of investigating the potency of drugs as placed on the market by the manufacturers; but instead, it was desired, as has been already stated, to find the variation of potency of these tinctures as dispensed at any point throughout the country. By making this survey and publishing the results, it would therefore be possible to arouse the interest and attention of the physician and the druggist to the desirability of care

TABLE I

TINCTURES OF DIGITALIS

Sample No.	*Purchased at*	*Country of manufacture*	*Package*	*Received*
1	Montreal	Gt. Britain	Original sealed	Apr. 2–25
2	"	Canada	"	"
3	Toronto	"	Unsealed	Apr. 7–25
4	"	"	"	"
5	Vancouver	"	Rebottled	Apr. 14–25
6	Ottawa	"	Original sealed	Mar. 23–25
7	Winnipeg	U.S.	"	Apr. 22–25
8	"	"	Rebottled	"
9	"	Gt. Britain	"	"
10	Halifax	Canada	"	May 4–25
11	Toronto	"	Unsealed	Apr. 7–25
12	Winnipeg	"	Rebottled	Apr. 22–25
13	Halifax	U. S.	"	"
14	Ottawa	Canada	"	Mar. 23– 5
15	Toronto	U. S.	Original sealed	Apr. 7–25
16	"	Canada	Unsealed	"
17	Vancouver	Gt. Britain	Rebottled	Apr. 14–25
18	Winnipeg	Canada	"	Apr. 22–25
19	Toronto	Gt. Britain	"	Apr. 7–25
20	"	Canada	Original sealed	"
21	Halifax	U. S.	"	May 4–25
22	Toronto	"	"	Apr. 7–25
23	Vancouver	"	"	Apr. 14–25
24	"	Canada	"	"

TABLE II

TINCTURES OF STROPHANTHUS

Sample No.	*Purchased at*	*Country of Origin*	*Package*	*Received*
1	Halifax	Canada	Unsealed	May 4–25
2	Vancouver	"	Rebottled	Apr. 14–25
3	"	U. S.?	"	"
4	Ottawa	Canada	Unsealed	Mar. 23–25
5	Toronto	"	"	Apr. 14–25
6	"	"	"	Apr. 7–25
7	"	"	"	"
8	"	"	"	"
9	Winnipeg	"	Rebottled	Apr. 22–25
10	Montreal	"	Original sealed	Apr. 2–25
11	"	Gt. Britain	"	"
12	Toronto	"	Rebottled	Apr. 7–25

TABLE III

TINCTURES OF DIGITALIS

Sample No.	*Description*	*Expiration date*	*No. of frogs used in test*	*Date of final test*	*Potency*
1	B.P. P.S.	Mar. 1926	23	May 8–25	133%
2	B.P. P.S.	May 1925	14	Apr. 25–25	120%
3	B.P.		12	Apr. 28–25	150%
4	B.P. P.S.		12	May 8–25	65%
5	B.P.		11	June 20–25	30%
6	B.P. P.S.	May 1925	9	May 13–25	150%
7	U.S.P. "		9	"	85%
8	"		24	June 27–25	75%
9	B.P. Concentrated		29	June 24–25	330%
10	B.P.		21	June 25–25	75%
11	B.P.		12	"	75%
12	B.P.		15	June 29–25	85%
13	U.S.P.		15	June 27–25	80%
14	B.P.		15	June 29–25	65%
15	U.S.P. P.S.		17	July 10–25	80%
16	B.P.		14	"	75%
17	B.P.		24	July 15–25	75%
18	B.P.		15	July 13–25	75%
19	B.P.		24	July 15–25	65%
20	B.P. P.S.	May 1925	9	July 16–25	60%
21	U.S.P. "		18	July 22–25	35%
22	" "		18	"	40%
23	" "		9	July 23–25	50%
24	B.P. "	Feb. 1925	45	"	100%

Note:
B.P.—British Pharmacopœia, 1914.
U.S.P.—United States Pharmacopœia IX.
P.S.—Physiologically standardized.

TABLE IV

TINCTURES OF STROPHANTHUS

Sample No.	*Description*	*Date of manufacture*	*Date of final test*	*No. of frogs used*	*Potency*
1	B.P.		June 2	15	85%
2	"		" 20	32	120%
3	U.S.P. ?		" 5	14	55%
4	B.P.		" 2	15	110%
5	B.P.		" 17	22	30%
6	B.P.		" 18	24	17%
7	B.P.		" 9	23	35%
8	B.P.		" 10	15	50%
9	B.P.		" 17	23	175%
10	B.P. P.S.	Feb. 1924	" 4	15	150%
11	B.P. P.S.		" 4	15	135%
12	B.P. Concentrated		" 20	33	430%

Note:
B.P.—British Pharmacopœia, 1914.
P.S.—Physiologically standardized.
Sample 3 had neither place of manufacture nor name of pharmacopœia on its label.

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in the purchase and dispensing of these drugs. The need of a uniform standard of manufacture, and a uniform method of assay is greatly to be desired.

Tables I and II give the places at which the drugs were purchased, the place of manufacture, how dispensed and the date of reception in the laboratory.

From Table I it can be seen that the twenty-four samples of tincture of digitalis cover the open market very successfully. The samples were manufactured in Canada, Great Britain and the United States. Ten of these samples were in their original sealed containers, ten more had been rebottled by the local druggist, and four others were apparently in unsealed containers as issued by the manufacturer.

From Table II it can be seen that the twelve samples of tincture of strophanthus cover the market fairly widely, although not so well as those collected for digitalis. Apparently, there are not so many different products of strophanthus offered for sale in Canada. These samples have been manufactured nearly all in Canada, there being only two samples prepared in Great Britain and one in the United States. Only two samples have been dispensed in original sealed containers. Six samples were obtained

TABLE V

Sample No.	*Made in*	*Description*		*Package*	*Potency*
1	G. B.	B.P.	P.S.	Original sealed	133%
2	C	B.P.	P.S.	"	120%
3	C	B.P.		Unsealed	150%
4	C	B.P.	P.S.	"	65%
5	C	B.P.		Rebottled	30%
6	C	B.P.	P.S.	Original sealed	150%
7	U. S.	U.S.P.	"	"	85%
8	"	"		Rebottled	75%
9	G. B.	B.P.	Concentrated	"	330%
10	C	B.P		"	75%
11	C	B.P.		Unsealed	75%
12	C	B.P.		Rebottled	85%
33	U. S.	U.S.P.		"	80%
14	C	B.P.		"	65%
15	U. S.	U.S.P.	P.S.	Original sealed	80%
16	C	B.P.		Unsealed	75%
17	G. B.	B.P.		Rebottled	75%
18	C	B.P.		"	75%
19	G. B.	B.P.		"	65%
20	C	B.P.	P.S.	Original sealed	60%
21	U. S.	U.S.P.	"	"	35%
22	"	"	"	"	40%
23	"	"	"	"	50%
24	C	B.P.	"	"	100%

Note:
G.B.—Great Britain.
C.—Canada.
U.S.A.—United States of America.
B.P.—British Pharmacopœia.
U.S.P.—United States Pharmacopœia.
P.S.—Physiological standardization.

TABLE VI

TINCTURES OF STROPHANTHUS

Sample No.	*Made in*	*Description*		*Package*	*Potency*
1	C	B P		Unsealed	85%
2	C	"		Rebottled	120%
3	U.S.?	U.S.P.		"	55%
4	C	"		Unsealed	110%
5	C	"		"	30%
6	C	"		"	17%
7	C	"		"	35%
8	C	"		"	50%
9	C	"		Rebottled	175%
10	C	"	P.S.	Original sealed	150%
11	G. B.	"	P.S.	"	135%
12	"	"	Concentrated	Rebottled	430%

Note:
C.—Canada.
U.S.A.—United States of America.
G.B.—Great Britain.
B.P.—British Pharmacopœia.
U.S.P.—United States Pharmacopœia.
P.S.—Physiological standardization.

TABLE VII

TINCTURES OF DIGITALIS

Manufacturer	*Description*	*Package*	*Expiration date*	*Potency*
A	B.P. P.S.	Unsealed		65%
B	"	"		150%
C	"	"		75%
D	"	"		70%
E	"	"		75%
F 1	"	Rebottled		65%
2	"	"		75%
3	"	"		30%
G 1	U.S.P. P.S.	Original sealed		50%
2	"	"		40%
3	" "	"		35%
4	" "	"		85%
H 1	B.P.	Rebottled		65%
2	"	"		75%
3	"	"		330%
4	" P.S.	Original sealed	Mar. 1926	133%
I 1	U.S.P.	Rebottled		75%
2	" P.S.	Original sealed		80%
3	"	Rebottled		80%
J 1	B.P.	"		85%
2	" P.S.	Original sealed	May 1925	120%
3	" "	"	"	60%
4	" "	"	"	100%
5	" "	"	Feb. 1925	150%

TABLE VIII

TINCTURES OF STROPHANTHUS

Manufacturer	*Description*		*Package*	*Date of manufacture*	*Potency*
A 1	B.P	Concentrated	Rebottled		430%
2	"	P S.	Original sealed		135%
B 1	"	"	"	Feb. 1924	150%
2	"		Rebottled		175%
C	"		Unsealed		50%
D	"		"		30%
E	"		"		17%
F	"		"		35%
G 1	"		"		110%
2			Rebottled		120%
3	"		Unsealed		85%
H	U.S.		Rebottled		55%

in unsealed containers, and four were rebottled by the dispensing druggist.

In Table III further data on the tinctures of digitalis are given which were not published in the previous article.

Table IV gives the data for tinctures of strophanthus that Table III gives for tinctures of digitalis.

Table V shows part of the data from Tables I and III rearranged and Table VI shows part of the data from Tables II and IV rearranged. These two Tables V and VI show the country of origin, whether B.P. or U.S.P., whether physiologically standardized, the condition of tinctures as dispensed and the potency of the tinctures.

In Tables VII and VIII, the two tables given in the previous article have been repeated and extended. These two tables now show the samples of the different manufacturers collected together, (without giving the names of the manufacturer), the pharmacopœial name with which they were labelled, whether physiologically standardized, how they were dispensed, whether as issued by the manufacturer, or rebottled by the dispensing druggist, and the date of manufacture or the date at which their use is no longer recommended and the potency of the various samples.

Conclusion

An examination of these tables shows that all the samples exhibit great variation in potency throughout the entire lot, and also among the samples of the same manufacturer as sold or dispensed by the local druggist.

The tables show that the variation is just as great in those samples from manufacturers in the United States and Great Britain as in those made in Canada.

A study of the tables shows that if a physician wishes to obtain a potent tincture of either digitalis or strophanthus, he must purchase the tincture of a *reliable manufacturer*; that he must purchase the tincture in its *original sealed container* and that the tincture must be of *recent manufacture* and be from a manufacturer who carries out a *physiological standardization of his product.*

It is suggested that the manufacturer and the retail druggist combine in their own interests, and in those of the medical profession, and, through the latter for the protection of the public, to evolve a system of recall and replacement of such preparations upon reaching a date of expiration as printed on the manufacturers' labels.

China Medical Association.—In spite of the political situation the China Medical Association held its eighteenth Biennial Conference at the beginning of this month in Peking. Since the last of these conferences the Association has dropped the word "missionary" from its title so as to become more representative of medical interests in China, and the broadened basis has brought an increase of membership. Those who administer its affairs are doing good work under considerable difficulties, and during the past year or so these have been increased by the enforced invaliding from China of the President and Vice-President of the Association and the Editor of its journal. Missionaries seldom have large financial resources and the Association is without any endowment fund. It would hardly have been possible to carry on the work at all but for assistance from the China Medical Board of the Rockefeller Foundation, which during the past five years has contributed 25,000 dollars towards its expenses. Unfortunately, the period of this grant now comes to an end, but the successful record of the Association's work should strongly recommend renewal of the subsidy. Even the précis of papers read at the Conference make it obvious that really valuable work is being done in various parts of China by members of the Association, and the programme shows that they have an efficient organization; the *China Medical Journal,* which records their research and opinions, has become familiar throughout the world. At the suggestion of the Association the various medical societies of China have formed a joint council which is working for public health, and the courageous way in which the immense sanitary problems of that country are thus being faced makes it reasonable to hope for important if gradual reform. —*The Lancet,* Oct. 2, 1926.

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THE VALUE OF ORGANIZED SUPERVISION IN THE CARE OF CHILDREN AS EXEMPLIFIED BY RESULTS AT THE INFANTS' HOME, TORONTO*

By A. P. Hart, M.D.

Toronto

THE following report of the results obtained in the Infants' Home in Toronto may be of interest as exemplifying the value of organized supervision in the care of children. Our results should be more or less comparable to those of the general population since these children are all in boarded homes, except that a very large percentage are in an extremely poor condition when admitted under our care. We have, however, a much better opportunity than the average doctor in securing careful supervision of these children as our nurses visit the homes regularly to see that instructions are carried out. Even the average pædiatrician in a large percentage of his private cases does not have opportunities equal to our own, because in a number of his cases visits are infrequent because of financial reasons, and as a rule he does not have the benefit of the nurse's supervision in the home. In the poorer homes where supervision by public health nurses is fairly thorough, there is not the same feeling of obligation to carry out instructions that there is with the foster mothers who are more under our control.

As the result of our experience we are of the opinion that the mortality was less, that we did not have the same percentage of disease and that the general physical condition of our children was better than that of the average population. The difficulty is to show this. The only statistics which we could obtain regarding the general populace were the mortality rates. It will be seen, however, that our disease incidence is of lower percentage even than the mortality rates obtainable for the general population. From these facts I think the natural deduction is that the general physical condition of our children who are under organized supervision is better than the general average.

The Public Health Department kindly furnished us with the total deaths and their causes for the City of Toronto and estimated the total population under one year of age on a percentage basis. The last is necessarily not absolutely accurate, but it is approximately so.

DEATHS UNDER ONE YEAR OF AGE, 1925

City of Toronto

Estimated population under on year		13,200
Total deaths under one year exclusive of stillbirths		882

Mortality Rate, 66 per thousand

Deaths

Acute communicable diseases		21
Measles	3	
Whooping cough	17	
Diphtheria	1	
Influenza		11
Erysipelas		5
Tuberculosis		16
Syphilis		9
Rickets		9
Convulsions		7
Ear and mastoid process		19
Bronchitis		5
Broncho-pneumonia		78
Pneumonia		21
Pharynx and tonsils		10
Diarrhœa and enteritis		89
Intestinal obstruction, hernia		10
Nephritis		1
Congenital malformation		106
Congenital debility		54
Prematurity		249
Injury at birth		50
Other early infancy		41
Accidental deaths		10
Miscellaneous		61

Infants' Home

Average daily population of babies under one year	75
Total deaths	4

Mortality Rate, 53 per Thousand

Deaths

Spina bifida	1	Age, 2 mos.
Sudden death	1	Age, 2 mos.
Thymus	1	Age, 5 mos.
Tetany—otitis media	1	Age, 4 mos.

Illnesses

Admitted to H. S. C.

Pneumonia	1	Age, 9 mos.
Convulsions (Pyelitis)	1	Age, 8 mos.
Observation hydrocephalus	1	Age, 4 mos.
Intestinal intoxication	1	Age, 6 mos.
Tetany—otitis media	1	Age, 4 mos.
Spina bifida	1	Age, 2 mos.

* Read at the fourth annual meeting of the Canadian Society for the Study of Diseases of Children, Gananoque, June 12, 1926.

Illnesses in Boarding Homes

Diarrhœa	18
Whooping cough	11
Measles	7
Chicken pox	4
Convulsions	3
Marasmus	1

It will be seen from the tables that whereas the number of deaths in the general population for the City of Toronto in children under one year, exclusive of still births with an estimated population of 13,200 is 882, which works out at sixty-six per 1000; in our average daily population of seventy-five under one year there are only four deaths, which works out at fifty-three per 1000. I may point out that, although our admissions of children under one year of age were 221, owing to the fact that a number of these cases are only under our care for from a few weeks or days to a few months or longer, our average daily population of children under one year was seventy-five, and also that as a rule the risk in these cases when we first receive them is very much greater than after we have them some time, so that if we could have averaged them up to keep them all one year our figures would be that much more striking.

When we come to analyze the liability to disease, if we take for instance pneumonia, it will be seen that whereas the general population had a death rate of 99 in children under one year we had no deaths and only one case. It would have been interesting to have compared the total incidence of pneumonia in the general population with the incidence in our population, but I had no means of arriving at this, for reasons which will be obvious. If we draw attention particularly to simply one other of the diseases which worries us perhaps most in children of this age, namely diarrhœa, we find that the city had eighty-nine deaths. We had no deaths and an incidence of only eighteen cases. It would be interesting again to know the total incidence of this disease in the city's population of children the same age.

I think that a comparison of these figures demonstrates the value of organized supervision of children by trained workers, not only in lowering the general mortality rate but also by having their general physical condition at as high a standard as possible and in materially lessening the incidence of disease. It does not require a particularly vivid imagination to picture the saving to the state thus effected both as regards life and financially, and although our Anglo-Saxon spirit of independence and resentment of anything which we feel may be encroaching upon our rights would prevent any general application of such principles at present, the general trend in medicine must gradually work this way, and perhaps, although we say our home is our castle, parents will not always be allowed to bring up children without the application of the most modern knowledge of feeding, hygiene and ing the general mortality rate, but also by having preventive medicine.

Reported by a Western Correspondent.—Today we got the following letter from an eastern city.

"Dear sir:—(1) Kindly let me know what qualifications are necessary to enter the medical profession specializing all diseases. (2) Specializing two diseases only."

Sometime earlier a doctor from the east wrote to us asking what were the special diseases of the people out here, whether we were equipped with any hospitals, if we had laboratories, as he thought he would come out to do the city surgery in one of the cities in Alberta.

The New York State Commission on Ventilation has recently opened an office at 370 Seventh Avenue, New York. The original members of the commission, Professor C.-E. A. Winslow (chairman), D. D. Kimball, Professor Frederic S. Lee, Dr. James Alexander Miller, Professor Earle B. Phelps and Professor Edward L. Thorndike, continue to serve, and Mr. Thomas J. Duffield has become associated with the commission in the capacity of executive secretary. The commission, which has been quiescent since the publication of the exhaustive report of its findings in 1923, now intends to assume again an active rôle, and to become a clearing house for the dissemination of accepted theories in the science of ventilation. Its work, as in the previous years of its existence, is being financed by the Milbank Memorial Fund of New York.

XUM

Case Reports

SEVERE RENAL TRAUMA WITH RUPTURE OF RENAL ARTERY:—ABSENCE OF HÆMATURIA

By A. H. Greenwood, M.D.

St. Catharines

The standard text-books on urology state that hæmaturia is present in approximately 90 per cent of renal injuries and if absent, the absence is due either to severance of the ureter or its obstruction by blood clots. The following case, in which trauma sufficiently severe to divide completely the renal artery and not damage the other renal structures, seems so unusual, that it is herewith reported.

Case 1,089–26.—Male, age fourteen, whose previous history is irrelevant, while sleighing was thrown violently against a tree, striking his left lower antero-lateral chest wall and flank. When seen three hours later at his home there was moderate shock, with pain and tenderness over the eighth, ninth, and tenth ribs in the midaxillary line, slight upper left abdominal rigidity with corresponding tenderness, but with no acceleration of his pulse rate. During that night he vomited twice, defecated and voided, the latter showing only an occasional red blood cell in the centrifugalized specimen. On second examination fourteen hours later there was slight pallor, slight stabbing pain in the upper left abdominal zone, tenderness in the left flank with marked rigidity over the entire upper abdomen, and tenderness in the left costo-muscular angle. Urine examination again normal and temperature 98.0, pulse 88, respiration 22. One hour later I was urgently summoned to see the patient to find him in extreme collapse, imperceptible pulse and air-hunger. He was immediately hospitalized, 800 c.c. citrated blood transfused and the abdomen opened with a provisional diagnosis of ruptured spleen. The stomach which was enormously dilated was collapsed with stomach tube and suction and except for about 100 c.c. bloody fluid the general peritoneal cavity was negative. In the left renal area was seen a large retroperitoneal hæmatoma and on delivering the kidney from this I found a few subcapsular hæmorrhages, ureter and vein intact but the artery completely severed at the hilus. Nephrectomy was rapidly performed and the abdomen closed. Convalescence was uneventful.

ACUTE LYMPHATIC LEUKÆMIA

By A. Stanley Kirkland

Saint John, N.B.

Osler and McCrae state that "acute lymphatic leukæmia is the most terrible of all blood diseases." These cases are fortunately not seen frequently, for this reason we feel it worth while reporting our case. In current text books it is advised that x-ray therapy be not used in acute cases. This patient was so ill that x-ray was exhibited as a final resort and the result was appreciated by both clinician and the family of the patient.

Present Illness.—Began on September 1st while on his way home from school. He had a feeling of a foreign body in left eye and noticed that on smiling, face was drawn to left. On September 3rd, he played a game of football. On September 6th, while attending the exhibition, he fainted and was first seen by his physician. At this time, there were a few bluish discolourations over his body, thought due to football injuries. On September 7th, there was bleeding from the nose and from gums of lower jaw. On September 9th, swelling of the neck became apparent, and this swelling extended over the cheeks, temporal region and about both eyes. The swelling began on the right side of neck and was not painful. On September 12th, hæmorrhages appeared in the conjunctivæ and into the eyelids and became progressively worse until admission to hospital. On September 13th, many small petechial hæmorrhages appeared in skin, more numerous over upper part of trunk and arms. At this time, pallor became a marked feature. On September 15th, he was admitted to hospital.

Past History.—He had passed through an attack of mumps, measles, pertussis; the history otherwise was negative. The family history was also negative.

Present Condition.—A white boy; age fifteen; height five feet, eleven inches; weight 167 pounds; exceptionally well developed and mature. Face is extremely swollen. There is a wide area of bluish stain about each eye, and the conjunctivæ are swollen and blood-red. On smiling, mouth is drawn to left side. The breath was foul, the tongue was coated and the gums swollen and bleeding; the teeth were good, petechiæ were seen in the buccal mucous membranes. The lad suffered from marked deafness; the tonsils were swollen, the neck was swollen, and measured sixteen and a half inches; enlarged palpable glands were felt in all the neck triangles from base of ear to clavicle. The glands were discrete and not tender. The spleen was palpable a hand's breadth below ribs. Pulse 100, blood pressure 120-70. The chest was negative. Petechial hæmorrhages were seen over greater portion of the body surface; but were especially large over anterior surfaces of both legs, elbows and dorsal surface of left foot.

The patient was very seriously ill, and in the face of adverse opinion I suggested that x-ray of the spleen and long bones might be tried as a measure to provide temporary improvement. This was done, and a reduction in the white blood corpuscles from 93,200 to 1,700 resulted in three days. The x-ray was then stopped on account of the drop in the red blood cells and hæmoglobin, a transfusion of one pint of blood was given by citrate method by Dr. H. L. Abramson. The blood picture was watched daily and x-ray therapy provided whenever a rise in the white blood cells was apparent. In every instance, the reduction in the white cells was almost immediate. The number of the red cells was also reduced as well as the hæmoglobin. When this reduction became alarming, the deficiency was supplied by transfusion.

On admission, the blood examination showed red blood cells, 2,630,000; white blood cells, 93,200; hæmoglobin, 6.42; polymorphonuclears 6, small mononuclears 80, large mononuclears 14, and no change in the character of red cells, but as the disease progressed, there appeared irregularity in size and shape of the red cells. Achromia, nucleated reds, polychromatophilia, poikilocytes. Temperature averaged from 99° to 100° with two elevations to 102 °during chills; immediately antemortem temperature rose to 104.2°.

Medication.—Consisted in intramuscular iron and arsenic, and calcium lactate and an attempt was made to provide a high cholesterol diet but this was refused. The patient died on October 14, 1926, approximately six weeks from onset. The features that were of interest to us were:—

First, the presence of a majority of small, rather than of large mononuclear lymphocytes.

Second, the prompt and repeated reduction in white blood cells following x-ray therapy, and the improvement in the patient's general condition after such treatment. This improvement was indicated by increase in the comfort of the patient, stoppage of hæmorrhages, relief of deafness and reduction in swelling of neck and face.

Third, the extension of the period of life. This patient, it is true, died within the allotted time interval of the disease, but the several clinicians who saw this boy at the time of his admission were convinced that his prognosis of life should be estimated in hours rather than days. If they were approximately correct in their guess, this young man's life was extended by x-ray therapy, and he was kept relatively comfortable; also this extension of life allowed a period during which it was possible for several relatives, who lived at a distance, to visit their sick one. In the case of an adult, this period would allow time to arrange business affairs. For these reasons, I would advise in further cases that they should receive the possible benefits to be derived from x-ray.

REPORT OF BLOOD FINDINGS WITH X-RAY AND TRANSFUSIONS

Date	*WBC*	*RBC*	*HB*	*Trans.*	*X-Ray*
Sept. 15	93,200	2,630	42		x
16	4,800	2,820	35		x
17	1,900	1,600	28	one pint chill.	x
18	1,700	2,400	38		
20	2,800	2,860	43		
21	4,300	2,040	43		
22	26,800	2,520	44		x
23	18,700	2,460	43		x
24	17,000	2,510	43		
27	43,200	2,550	42		
28	65,800	2,110	35		x
29	51,000	3,310	44		x
Oct. 2	4,000	1,790	36		
4	12,000	1,790	30		
5	22,800	1,030	25		
6	45,400	1,180	23		
7	100,000	1,210	23	500 c.c.	x
9	34,000	1,620	28		
11	12,400	1,080	26		
12	27,200	1,200	25		

To Dr. G. A. B. Addy I am indebted for the privilege of reporting the case, to Dr. H. L. Abramson for findings in the blood condition and to Dr. T. F. Meahan for the history.

INFECTED HAND FOLLOWED BY LOSS OF POWER IN THE EXTENSORS OF FINGERS AND THUMBS

By G. G. Corbet, M.D.

Chief Medical Officer of New Brunswick Workmen's Compensation Board
Saint John, New Brunswick

In my official capacity as Medical Examiner for the New Brunswick Workmen's Compensation Board, I come across many interesting end results of infection. In industrial surgery, the surgeon should always keep in mind: (1) a treatment that will ensure a rapid recovery so that the patient can get back to his work as soon as possible, to provide for himself and family; (2) a good functional and anatomical result so that the patient will not suffer all his life with a permanent disability which would prevent him from earning his full stated salary. Of the many interesting cases, I wish to present the following:—

A. K., age twenty-one; male, claim No. 422,800-D–A65–1513, worked with sugar refinery. While employed breaking up large lumps of sugar with a mallet, he blistered his hand on March 24, 1926, and it became infected. He stopped work. On March 31, 1926, under ether anæsthesia, his attending surgeon incised hand making a through and through incision between fourth and fifth metacarpals and inserting a drainage tube, and twice daily placed hand in hot baths and applied moist dressings. The tube was removed on April 8th. On April 17th, there was no discharge and on April 26th, the hand was healed, but the patient could not extend his fingers and the hand grip was weak. On the following dates I examined his hand and found as follows:—On May 14th, he was unable to extend his fingers or thumb at metacarpal-phalangeal joints, flexion fairly good. I advised physio-therapy. On June 9th, I found very slight improvement; physio-therapy continued. On June 16th, very slight, if any, improvement. On July 23rd, slight improvement of thumb and index fingers. On August 13th, all movements at wrist normal; these wrist movements were normal all through his illness. He can close fingers making a good fist, but he cannot open his fingers beyond two inches from the palm.

When I tried to arrive at a working diagnosis, I found difficulty in deciding what was the actual cause of the loss of power of the extensors of the thumb and fingers. In checking up the anatomy, I found the following muscles were not functioning: (1) the extensor communis digitorium; (2) extensor minimi digiti; (3) extensor ossis metacarpi pollicis; (4) extensor brevis and longus pollicis; (5) the extensor indicis. All the above muscles are supplied by the posterior interosseous nerve, a branch of the musculo-spiral.

The question was, why had the extensors lost their function? The incision, placed as it was between the fourth and fifth metacarpals could not have severed all the tendons of the above mentioned muscles. Damage to tendons by *severance* was ruled out. Next, what part did infection play in producing this condition? The wound healed kindly, but quite early, there was loss of function of extensors of thumb and fingers. How did this condition occur? One naturally thinks of adhesions of the extensor tendons to their sheaths and surrounding structures. This was ruled out, as his fingers and thumb could be quite easily extended, but he was unable to keep them in this position. There was no bone or fibrous ankylosis. Ankylosis due to adhesions was, therefore, ruled out. Damage to posterior interosseous nerve was considered but I could not find any signs indicating that part of this nerve had sloughed out. The nature of the infection was not ascertained as no culture was taken (as far as I know). If part of this nerve had not sloughed, what caused the flaccid paralysis of the extensors? I am led to the conviction that the infection, what ever was its nature, must have produced some toxin that paralyzed the lower part of this nerve and did not affect any of the sensory nerves, nor the nerve associated with the power of flexing and fingers and thumb

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"Miserable indeed is the lot of man in the state of infancy. He comes into the world more helpless than any other animal, and stands much longer in need of the protection and care of his parents; but, alas! this care is not always bestowed upon him; and when it is, he often suffers as much from improper management as he would have done from neglect."—William Buchan, *Domestic Medicine*, eighth edition, 1784.

Reviews and Retrospects

MYOCARDIAL INSUFFICIENCY, ITS PREVENTION AND TREATMENT*

By A. T. Henderson, M.D.

Montreal

While it is admitted that myocardial insufficiency may be caused by chronic infections, valvular disease and intoxications, in the majority of cases it is preceded by hypertension. A hypertension, neglected, is prone to progress to angina, apoplexy or myocardial failure; the family history may indicate which. Allbutt defined the extreme figure for a normal blood pressure, regardless of age, as 140 systolic and 90 diastolic. Unless discovered by a routine or an insurance examination, a hypertension may exist for months or years before it is discovered. Eventually, the patient comes complaining of nervousness, periods of depression, vertigo, headache, fullness in the head, tinnitus, impaired vision, temporal thumping, palpitation, etc. As the untreated hypertension progresses, the left ventricle begins to feel the strain, and the degenerative process is facilitated by changes in the coronary vessels. In the change from an uncomplicated arterial hypertension to myocardial insufficiency, we usually have a lowering of the systolic pressure, and an approximation of the systolic and diastolic pressures; in other words, a smaller "differential pressure". When upon slight exertion, a case of marked hypertension fails to show a further rise in systolic pressure, but a fall, it indicates that the limit of myocardial reserve has been reached. Coincidently with the defeat of the myocardium, the symptoms of hypertension above enumerated become less marked. Fahr is quoted as stating that 75 per cent of the cases of chronic myocarditis originate in hypertension. Therefore, to reduce the blood pressure to satisfactory levels, is to prevent myocardial overstrain. This problem is one of the greatest in medicine to-day. A brief enumeration of the methods employed may be given.

So far as drugs are concerned, the nitrites are important, amyl nitrite and nitroglycerine for emergency, and erythrol tetranitrate for more lasting effect. The iodides, except in specific cases, may be harmful. Calcium salts and atropine have been recommended by some for cases in which there is supposed vagus predominance over the sympathetic. Of organic extracts, corpus luteum has been claimed to give good results in certain cases. In crises such as angiospasms, acute pulmonary congestion and cerebral œdema, rapid venesection is most effective. In threatened apoplexy, lumbar puncture is useful. While treatment by high frequency electricity has its enthusiastic exponents, the authors have seen it make no impression on any hypertension which had first proved refractory to a strict diet. Tincture of digitalis in large doses, or in small doses where the diuretic effect only is desired, is probably the most valuable pharmaceutical agent available. Other diuretics such as caffeine sodio-benzoate, theocin, theophylin and diuretin are employed. If these are ineffective, euphyllin, novasurol or salyrgan may be tried. Euphyllin is a safe diuretic. Novasurol, a powerful agent in cardiac dropsy, is not advised in extreme hypertension, in impaired kidney function, and in cases of extreme myocardial decompensation, where the increased blood volume following mobilization of œdema fluid into the blood stream, might impose too great a load on the heart. Saxl overcomes this by preparing the heart for two or three days with digitalis or strophanthin.

Diet.—So far as protein is concerned, Allbutt, Volhard, Mosenthal and others have shown that no benefit accrues by restricting protein in cases where there is no evidence of nitrogen retention.

Salt restriction.—While this is observed by all in œdema cases, Duncan and Rudy, from the Psychiatric Institute, at Morristown, N.J., find great benefit also in uncomplicated hypertension. The standard set at the institute is to keep the salt intake sufficiently low so that the total twenty-four hour chloride excretion shall not exceed 0.5 gram. Under this salt-free diet, in many cases, there is a transformation in the first few days or weeks, not accounted for by rest, psychic influence or other hypothesis. Of 328 cases with systolic pressures of over 190 and diastolic over 110 under treatment in the past six years, the total mortality has been 13 per cent. This includes those who were unfaithful with their diet, those who had all degrees of kidney involvement, and those who had suffered cerebral hæmorrhage, as well as those who had no complications. In this series, 19 per cent of the pressures were reduced to normal. In no case were there uncomfortable symptoms following the reduction. A plasma chloride level above 0.59 per cent in uncomplicated hypertension, provides in the experience of the authors, a favourable prognosis. On the other hand, a chloride percentage below 0.56 is more resistant to treatment. However, the value of the plasma chloride level is subject to question, particularly in the presence of any œdema.

* Myocardial insufficiency following arterial hypertension; its prevention and treatment, by G. Garfield Duncan and Abrama Rudy, *Am. J. M. Sc.*, September, 1926.

In conclusion, the authors state that in the treatment of myocardial insufficiency following hypertension, a strictly salt-free diet has proven more effective than have the diets where more emphasis has been laid on the pharmaceutical preparations employed. In the salt-free diet, no salt or sodium bicarbonate is allowed to be added to any food either in the cooking or at the table. Excluded also are all foods high in salt such as bacon, ham, corned beef, tongue, salted or dried fish and smoked or preserved meats, as well as baker's bread and cakes; canned fruits, vegetables and soups; prepared cereals such as cornflakes; milk and cheese. Patients are allowed fruit in the form of apples, oranges and grapefruit; cereals as oatmeal, farina, shredded wheat or puffed rice with thick cream, eggs and salt-free meat, home prepared salt-free soups, fresh vegetables. Canned vegetables must be brought to a boil three times and the water discarded. Allowed also are salt-free homemade bread and sweet butter, tea and coffee in moderation, and flavouring materials if properly used.

Tonsillectomy in Children.—Based on an analysis of the complaints of 1,200 children with the results found three years later, and compared to 1,200 children with similar complaints, but in whom operation was denied but also examined three years later, the following conclusions are drawn by Albert D. Kaiser, N.Y., as bearing on the indications for tonsillectomy and adenoidectomy: 1. Mouth breathing is a definite indication for tonsil and adenoid removal. 2. Frequent attacks of sore throat and tonsillitis offer a definite cause for removal of tonsils. 3. Frequent head colds, relieved in 75 per cent of the cases, offer a definite indication for tonsil and adenoid removal. 4. Persistent enlargement of the cervical glands, when no other cause is found, is a just cause for tonsil removal. 5 Malnutrition, when other causes have been eliminated, will be improved somewhat and therefore may be considered an indication. 6. Chronic and recurrent discharging ears are an indication for the operation. 7. Unexplained fevers, in the absence of other indications, may be a just cause for tonsillectomy; but there is no guarantee that they will not recur unless the fever comes from an obscure tonsil infection. 8. For the prevention of respiratory infections, such as laryngitis, bronchitis and pneumonia, no positive indication exists, as the incidence of these infections was not influenced favourably or unfavourably by operation.—*J. Am. M. Ass.*, Sept. 25, 1926.

Family Physician's Place in Inspection of School Children.—Mary Evelyn Brydon, Richmond, Va., attempts to show three things: first, that the present general method of caring for the health of school children is neither practical nor permanent; second, that it is possible to formulate a plan which will be both practical and permanent, and, third, that the family physician has a very definite place in such a plan. The Virginia plan is discussed. One of the main features of the Virginia plan at present is requiring every teacher to make a physical inspection of every pupil at the beginning of every session and of every pupil who may enter school after it begins. They differentiate between a physical inspection and a medical examination. The inspection is made in the schoolroom and the medical examination at the physician's office. In 1921, the state board of health formulated a course in physical inspection and school hygiene embodying the requirements of the West law. This course was approved by the state board of education, which made it a necessary part of the training of all prospective teachers and a requirement for all teachers applying for certificates. The course covers the following points: (1) Physical defects and their control. (2) Communicable diseases and their control. (3) Health instruction, including personal hygiene and prevention of accidents. (4) Care of the school plant. -Approximately 3,000 teachers a year received instruction in how to safeguard the health of children in the schoolroom. This was secured through one of the following agencies in Virginia: colleges; summer school courses; extension courses of colleges; correspondence courses given by one college and by the state board of health. To-day all students preparing to be teachers in the institutions offering teacher training are receiving this course.—*Jour. Am. Med. Ass.*, Sept. 18, 1926.

Editorial

THE MODERN SURGEON

IN the Harveian oration entitled "Before and After Operation" delivered before the Medical Society of London, Sir Berkeley Moynihan, insisted that surgery nowadays demanded much more than anatomical training and manual technique. Lister, he said, by his antiseptic and aseptic methods had opened up a range of possibilities in the way of surgical technique which is perhaps now almost exhausted. It remains for the surgeon to bring his brains into play, and do more for his patient before operation, study more carefully what happens to him afterward, and place all the information gained from the closer inspection of structural changes to add to our knowledge of the natural history of disease. There was a time, the orator said, when discovery lay mostly with physicians who had leisure to think, while surgeons were busy doing things. That time is now passed and gone, and Sir Berkeley Moynihan urged on all those who are embarking on a surgical career, that faith and the practice of investigation was as necessary for them as the technique of operation. Modern surgeons have had great opportunities to add to our knowledge, and in no department of medicine has better use been made of these opportunities. What Sir Berkeley aptly called the "Pathology of the Living" has completely revised our knowledge of the abdominal viscera. In the years before the surgeon opened the abdomen with impunity, the diagnosis of duodenal ulcer had almost never been made. Many will remember the happy outcome some years ago of Sir Berkeley Moynihan's invitation to the skeptical Dr. Hurst to come to Leeds, and see in the operating theatre some of the duodenal ulcers of which he doubted the existence. Of gastric ulcer we knew more, but the correlation between our pathological knowledge and our clinical acquaintance with the disease was woefully incomplete. To read the first edition of Fagge's work on Medicine, one of the greatest books ever written, and to compare what he then knew of cholelithiasis with what we know today is to realize the immense gain to clinical medicine which in great measure has resulted from the work of the surgeon. Surgery indeed is one of the strongest research weapons in the hands of the physician.

A further most interesting feature of recent surgery has been the disclosure of interactions between the various viscera. We believe now that all gastric and duodenal ulcers are secondary affections; that their cause often lies in an infection elsewhere, and that this infection travelling by various paths may be revealed at an operation undertaken primarily for curative purposes. So too with the causes of acute and chronic pancreatitis, and with their relation to disease in the appendix and gall bladder. The interaction between the liver and spleen is admirably illustrated by the effects of splenectomy. The truths thus learned could have been acquired in no other way so effectually as by way of the surgical operation performed for its curative results, but acting at the same time as a research method of the highest value.

The mere craft of surgery is at this date hardly capable of great advancement, though it is perhaps rash and dangerous to make such a statement. There is nothing in the craft of any art which can surpass in delicacy and beauty that shown by the skilful master of surgery, and the results are almost as near to finality and perfection as human effort can make them. If then the mere technique of surgery has reached its limits how is surgical work to advance? There is, I believe, great room for improvement in two directions. We should seek to ob-

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tain an earlier access to our patient, and should make greater efforts than are now generally made to improve the chances of the patient before operation and to help him regain health and strength after the operation is completed. An earlier access to the patient is abundantly justified by the success of surgery. The aid of surgery should no longer be withheld until without it there appears no prospect of relief or even of life. On the other hand, the surgeon should always be sure before operation that operative measures rather than medicinal treatment is necessary. He should also be sure that so far as is possible and practicable the patient is in the best physical and mental condition to undergo operation. He must also give thought to the appropriateness of the procedure; and finally he must not be content to allow his interest in the patient to cease when he survives the operation and the wound has soundly healed. In the future I look for advance not so much to improved methods of technique as to a wiser application of methods now almost perfected. It is our task to improve surgical judgment. Surgery has been made as safe as possible for the patient. We must now make the patient as safe as possible for the surgeon. It is the duty of the surgeon to obtain all desirable information regarding the condition of his patient before operation, changing these conditions to the patient's advantage, and after operation securing for him such conditions as may ensure his safety and the permanent success of the operation.

The science of surgery in days to come will be advanced by men trained in the methods and imbued with the spirit of experimental research. A surgeon should not simply be the tool of other minds, and not be simply required to carry out the mechanical and routine details of a procedure the necessity for which others have decided. A life is entrusted to his hands. It is for him to safeguard it, and to decide when surgical treatment is needed, and what shall be its scope and application.

THE PROGNOSIS OF ANGINA PECTORIS*

AN interesting article on this subject appears in the last number of the *Journal of the American Medical Association*, from the pen of Dr. Paul D. White of Boston, which presents thoughts and figures of value. While a few writers have from time to time ventured to discuss this subject, the majority in the past have dismissed it with the brief remark that "God alone knows." With a view, therefore, to determine whether we have any data of value on which to build a prognosis Dr. White presents us with a study of 200 consecutive cases seen in private practice during the past five years, and to them adds an analysis of Sir James Mackenzie's series published in 1923. Dr. White also adds a series of sixty-two consecutive cases of coronary thrombosis also seen during the last five years. While these studies by no means solve the problem, they present much information of value as very few writers have presented any extensive series of cases from their own experience. Sir James Mackenzie is a notable exception. He has discussed the records of 380 cases which he saw and treated but does not separate patients with typical coronary thrombosis from those of more definite angina pectoris.

It is at the outset noteworthy that all students of this condition from Heberden who was one of the first to give a description of *pectoris dolor*, in the eighteenth century, down to Osler in our own days, have felt the need of lightening the dire verdict associated with the very name of this affection by emphasizing the fact that the prognosis may in many cases be modified, and the symptoms may be compatible with many years of usefulness. Heberden in his description of

* The prognosis of angina pectoris, and of coronary thrombosis, Paul D. White, *J. Am. M. Ass.*, Chicago, Nov. 6, 1926, 1255.

this disease wrote that "there may be long periods of perfect health and with adequate rest many years may elapse without any other signs of defective health." Osler, in 1910, wrote: "that in patients whose symptoms are not of the more grave type, long intervals of good health, and even complete freedom may follow the adoption of reasonable habits, so that a severe attack of angina may prolong a man's life although the cardinal fact in the prognosis of true angina is its uncertainty. Much depends on the patient himself—on the life he has led—and the life he is willing to lead." Allbutt, in 1915, also wrote: "I would formally declare that the issue of angina pectoris is by no meals always mortal."

Mackenzie in 1923 gave the full records of 160 cases and the data of a number more. Altogether, he had details of 380 cases. Of these, he was able to trace 284 to their death from heart failure, and in 213 of these he was able to determine with reasonable accuracy the duration of life from the onset of angina to death. Judging from his series, the age at onset has but little to do with the duration of the disease. Of 120 patients whose death occurred within a period of five years from the date of the first symptoms, the age at the onset varied from thirty to eighty-three years. Of 58 dying between five and ten years of the onset, the age ranged from thirty-three to seventy-seven, while of the 35 who survived ten years, the ages varied between twenty-six and sixty-eight years. Although in view of the extreme range in the duration of life from the onset of symptoms—a few days to many years—it may seem idle to attempt an average duration, nevertheless such may be helpful. In Mackenzie's series of 213 patients the average duration from the onset until death occurred was 5.4 years. In discussing the signs of gravity in this affection Mackenzie emphasizes the serious prognostic significance of pulsus alternans, of nocturnal orthopnea, and marked Cheyne-Stokes respiration. Important, also, is the ease with which an attack is provoked, but here again judgment has to be exercised. In making a decision one must review the life of the man and find out what response his heart makes to effort, and to treatment by rest, and the manner in which his illness began. A prognosis should be very guarded when we see the patient for the first time, when a tendency to recurrence of the attacks may exist; a tendency which may in great measure be checked by a prolonged period of rest. In this affection every single case must be studied by itself, if we desire to give a reasonable prognosis. The data to be considered are the sex, age at onset, occupation, presence of hypertension, sclerosis, enlargement of the heart or heart block, a history of syphilitic infection, the presence of severe pain and its position, the character of the T wave in the electrocardiagram, and the degree of general nervous sensibility in the patient himself. All the patients included in Dr. White's series of 200 cases had a history of paroxysmal oppression in the front of the chest, often radiating to the left arm or to both arms, brought on by exercise, especially if taken shortly after eating, in cold weather, or when hurried; an oppression relieved within a few minutes by rest or by the administration of nitrites. Of 148 of these cases examined by the electrocardiagraph, thirty-eight, or 26 per cent, showed normal hearts on physical examination, normal blood pressure, and normal electrocardiagram. Of these thirty-eight, eleven or 29 per cent, survived at least five years after the onset of their illness; only two died in less than five years. Of the remaining 110 patients who showed abnormal hearts with hypertension on physical examination, thirty-four, or 31 per cent, died within the five years. The average duration from the onset of the angina to death in the sixty-six patients who died was 3.4 years, while the average duration to date in 124 living patients is 4.6 years. It would appear likely that when the series is completed the duration of life will be higher than in Mackenzie's, which gave a figure of 5.4 years. Auricular fibrillation was rare, occurring only three times in the 200 cases. The type of persons generally affected was the over-sensitive and nervous. Excess in

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the use of alcohol and tobacco was relatively rare. In fact, there were many abstainers from both. Alcohol in small amounts, however, seemed rather to help than to aggravate the condition. Tobacco in some had absolutely no effect. In others who were sensitive to it, it sometimes appeared to produce an aggravation. Overindulgence in athletics after middle life appeared not infrequently to precipitate an attack, and prolonged strain in business or professional work appeared to be equally injurious, especially after a man reaches the age of fifty. The build and muscular development of the patients in his series did not appear to be of much importance.

Much has recently been written on the diagnosis of coronary thrombosis. It is now as a rule a simple matter to make the diagnosis correctly. If a thrombosis occurs suddenly and in a large enough vessel to produce a fair sized infarct in the heart, the prolonged pain, substernal or epigastric, the failure of nitrites to afford relief, the large amount of morphine demanded, and the severe prostration for hours or days, all help in establishing the diagnosis which may be confirmed by signs of infarction, fever and leucocytosis and the electrocardiogram. The average duration of life after an attack of coronary thrombosis was fifteen and one-half months, ranging from a few hours to seven years. The average duration of life after the attack in the case of thirty survivors was twenty-four and one-half months to date.

In judging of the prognosis of angina pectoris Dr. White writes that hypertension, the history of syphilis or of coronary thrombosis, and evident arteriosclerosis, poor heart sounds, abnormal T wave in the electrocardiagram, and some cardiac enlargement, are symptoms more often met with in patients with angina who succumb within a few years, than in those who survive. The more severe the pain is the worse the prognosis. The factors in Dr. White's opinion helpful in determining a good prognosis are as follows:—The fact that the first attack developed under unusual provocation in a sensitive nervous patient; and in one who shows by physical examination little or no evidence of cardiac pathological change; that later attacks are only caused by considerable exertion and are not brought on by slight activity, or while at rest; and furthermore, that the patient can receive adequate rest and relaxation and shows a reasonably rapid response to this treatment. It would appear that in some instances an operation or even an accident, if not too severe, proves to be a blessing in disguise by enforcing prolonged rest in bed. Cervical sympathectomy performed on two of Dr. White's patients appeared to give little or no relief.

POSTURE

THE study of posture, or the way we stand, sit or lie down, has received added impetus of late. The subject at first glance seems neither complicated nor difficult. It has long been of mild interest, chiefly in connection with painting and sculpture, while in medicine it was associated with the development of scoliosis and allied deformities. Those interested in physical culture have long urged the importance, if not the necessity, of holding oneself properly, but great scepticism existed as to whether this was anything more than a fad. During past years much has been written on the subject in popular magazines. That it is, however, of the greatest importance is shown by the researches on its evolution and development by Sir Arthur Keith.* He points out that Lamarck in 1809 abandoned the belief that man's body was a special creation, and became a convert to the theory of evolution. In his *Philosophie Zoologique* we find the first clear-cut statement that man's posture of body was evolved from one

* Man's posture, its evolution and disorders, *Brit. M. J.*, March and April, 1923.

which was simian or ape-like. Lamarck regarded the erect posture as a result of the chimpanzee-like ancestor of man having abandoned an arboreal mode of life for one in the open country. However, Lamarck had no following in his theory of evolution, and we have to pass on to 1871, when Charles Darwin's *Descent of Man* was published. His theories had much in common with Lamarck's in regarding man as the descendant of an anthropoid ape, but in accounting for the transformation Darwin applied the law of natural selection, or the tendency of successful individuals to survive and prosper. In addition, he recognized the action of sexual selection, while perceiving that structures were also modified to suit function. Darwin's theories rapidly spread over the world, and there is no doubt that the *Descent of Man* is the starting point of our modern knowledge of all that pertains to the origin and evolution of the human body. It is interesting to note that neither Lamarck nor Darwin were professional anatomists, yet they did more to alter our conception of the human body than any professional anatomist of their time. The evidence from fossil remains of man is inconclusive as to the place or time when human posture was evolved, and we cannot say that any fossil form of man yet discovered shows a foot in a stage midway between the anthropoid apes and man. Plantigrade progression or walking upright was not developed by man himself for his especial benefit, as indeed both Darwin and Lamarck thought, but had come, we now know, into existence long before man was evolved. It is probable that the history of man's postural adaptations can be traced back to the gibbon. The gibbon is orthograde or upright in his gait, while his neighbours the monkeys are pronograde, with bodies held horizontally. It is highly probable that in the living gibbon we are dealing with an ancient and conservative type which has come through long geological epochs almost unchanged. The next stage tending to man's upright carriage came with the evolution of the great anthropoid apes, the chimpanzees, gorillas and orangs, the time being probably pre-miocene. The third and last is the human or plantigrade stage, during which the knees and thighs became straightened and the foot transformed. This plantigrade posture began to be evolved at least two to three millions of years ago. Now this postural change called for modification both in the brain and in the body. A higher degree of co-ordination of the spinal reflexes was demanded. The mid-brain, which regulates postural tone, and the cerebellum which has so much to do with the "timing" of the spinal centres, must gradually have undergone a high degree of elaboration and extension. With the upright position the lumbar spine became both shorter and stronger. The spinal musculature of necessity increased its attachment to the pelvis, and to improve the muscular leverage there arose an enormous development of the iliac crests. The thorax from being supported by the arms had now to support their weight and this involved an entire change of the muscular control.

How posture is maintained and to what extent its maintenance is automatic can best be studied in the work of Prof. Rudolf Magnus of Utrecht and his collaborators. His volume on the physiology of posture (*Körperstellung*) has been recently followed by two lectures given in Edinburgh.* In these lectures he describes numerous animal experiments by which he studied the effects on posture of reflexes originating in the eyes, ears, neck tissues, muscles and pads of the feet. The animals used had all been deprived of their cerebral cortex, and so of all voluntary effort, by an operation severing this seat of volition from the rest of the brain and spinal cord. As a result such animals were merely physiological preparations akin in some measure to the pithed frog of our student days, yet they presented little difference from a normal animal at rest. They were quite at their ease, and their attitude and movements were neither stiff or caricatured, and yet they all took

* Cameron Prize Lectures, *Lancet*, September 18 and 25, 1926.

place without the least possible effort of the will. It follows therefore that many of the movements of a normal animal are purely reflex, and are volitional only in appearance. A standing animal, Prof. Magnus has shown, maintains its position by no expenditure of voluntary effort. The standing position is reflexly and automatically maintained, and the legs instead of giving way are able to support the weight of the body as a result of stimuli coming mainly from the muscles concerned, but also from external structures such as the pads of the feet. The stretching of one muscle group influences other groups, so that the highest type of co-ordination results. No stream of volitional impulses is needed to maintain a given position; all is reflex and automatic. Volition is being driven to the highest cortical levels and we gain vastly in our knowledge regarding the function of long familiar anatomical structures. No study of posture can fail to notice the researches of Lovett regarding the centre of gravity of the body, nor the work of Goldthwait in drawing attention to the close relationship between proper posture and the highest bodily efficiency. No longer was bodily position a concern only of the artist or the physical culturist. The internist was taught that in the properly expanded chest lay the best chance of avoiding future tuberculosis, and that a weakened heart was further hindered by faulty depression of the ribs. A stooping position favoured a dropped diaphragm and visceroptosis, while the erect posture helped to maintain sagging coils of intestine and so to improve the abdominal circulation. The military position enforced by the drill sergeant was shown to encourage the highest bodily and mental efficiency.

Dr. Hall* deals most interestingly with poor posture and its attendant evils as viewed from the orthopaedic standpoint. The typically poor posture is a slouching attitude with knees flexed, lower abdomen prominent, shoulders stooping, lumbar spine hollow and the feet pronated. Such an individual is very likely to complain of backache due to the extra muscular effort needed to maintain the slouching position, to say nothing of sacro-iliac strain and sciatica. The feet will suffer, as too much weight is being thrown on their inner borders and there will be a tendency to knee strain, often leading to actual static arthritis. There will be pain between the shoulders due to the unnatural drag of the arms and there is likely to be visceroptosis or pot-belly with its attendant miseries. Many cases of poor body mechanics show a diminution of the metabolic rate suggesting imperfect thyroid function. These improve with thyroid medication. Dr. Hall's contention that there is a relationship between bodily mechanics and health seems well proved. It is evident that not only the kind of body one is blessed with, but also the way one uses it, counts for health. Posture in recumbency is being popularised as a means of treating certain ills. The half hour's rest on one's back after lunch prevents the undue accumulation of blood in the belly, thus avoiding that sleepy feeling. Dr. Swaim* of Boston advocates postural treatment in recumbency for arthritis. He points out that arthritics as a rule have bodies posturally deformed. Chronic fatigue is the result, with sub-normal morning temperature, poor pulse, vasomotor instability, low blood pressure and poor muscle tone. Such patients are likely to have flat chest, contracted ribs and a low diaphragm hindering the return flow of blood from the abdomen. The abdominal viscera are crowded downwards and the sympathetic ganglia are disturbed. He points out that the removal of a septic focus is often not enough to relieve the arthritis, and endeavours to improve body mechanics to complete the cure. His arthritic patients are given rest on their backs to overcome the chronic fatigue. After each meal a pillow is placed under the shoulders and the arms raised above the head.

* Observations of a medical man in an orthopædic clinic; *Boston Medical & Surgical Journal*, March 11, 1926.

* Orthopædic principles in the treatment of chronic arthritis, *Journal of Bone and Joint Surgery*, October, 1926.

This enlarges the thoracic cavity, promotes abdominal breathing and improves the visceral circulation. Joint congestion is thereby lessened and pain diminishes. The bowels are cleaned out from time to time with castor oil and irrigations. Good results are claimed from this mode of treatment. J. APPLETON NUTTER

THE CARE OF THE SICK*

MEANS OF DIAGNOSIS: HOW CAN THEY BE MADE MORE GENERALLY AVAILABLE?

A PREVIOUS article under this general heading suggested that modern medical science should be measured not by what it can do, but by what it does; not by an occasional almost miraculous achievement, but by its average of service to the average man in the average community. If the possibilities of medical science are not realized in service the fault may be found not in medical science, which can speak for itself, but in the administration of medical science, which is a part of our modern social system.

The old-fashioned snap diagnosis we used to hear about, made while the patient took his hat off, or the doctor crossed the threshold, cost very little, and usually had a value in proportion. But many of the processes in the utmost of modern diagnosis are inherently expensive and technical. No one-man medical office can contain them all; no ordinary purse afford them all; no single practitioner, however long he might study, could master them all. We may as well become accustomed, then, to the idea that medical science cannot be completely applied by any one man.

We surely cannot expect the man, who fights his way through prairie blizzards at midnight to the shack where a child lies ill, to use means in diagnosis that it takes tens of thousands of dollars in equipment and a considerable group of experts to provide at a few favored centres. That the specialized measures of the laboratory are available for so small a percentage of the sick, is one of the grave defects of our system. The man in the trenches, grappling with his enemy man to man, almost as cave men fought, still has telephones, batteries, aeroplanes, barrage, supporting battalions, transportation, ammunition dumps, munition factories, the whole might of co-ordinated military science behind him. He is a unit in a highly organized army that makes ten thousand different services all bear at one point, the firing line; one aim throughout all, the defeat of the enemy. To attack one isolated sentry is to challenge the full might of a million men. A primitive army was a mob; a modern army is a complex and effective machine.

The modern medical army as it attacks disease in communities is fairly modern and effective. As it attacks disease in individuals it is almost a mob, with little concerted action, little co-ordination, no one plan of campaign. Indeed, it can scarcely be said to attack disease at all. The individual medical soldier has to wait until disease attacks, then engage as best he can, pretty much on the primitive plan of "When you see a head, hit it." He knows that somewhere behind him are the many marvels of medical artillery, and cavalry and engineering, but has little means of bringing them to his support. He may call for help and may get it, but none will come automatically at his time of need.

The medical army is perhaps not so much like a mediaeval mob-army. It is more what a modern army would be with all its fine men and equipment intact, but with no organization, all co-ordination and command done away with. Medical practitioners still have to attack disease as privateers rather than as the King's Navy. That their performance under the circumstances should be on the

* Second abstract from presidential address read before the Manitoba Medical Association, Sept., 1926.

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whole in a fine spirit, is very creditable.

Private physicians need the utmost in facilities for diagnosis, but cannot provide them. Groups of physicians, except very large groups, cannot. The large hospitals can do better, but only with much worry about ways and means; the smaller hospitals cannot.

The solution would seem to be that the more expensive and technical facilities for diagnosis should be made available on some well-considered plan by the community in some form, municipal, provincial or national. This is not so new a proposal as it may seem. The community has already gone part way. A diphtheria swab whether from duke's son or cook's son is examined forthwith, by the community, because one prompt diagnosis of diphtheria may save a hundred lives. But a urine specimen which might show nephritis or diabetes or any one of a hundred other ills is in quite a different category. Sputum will be examined to find disease at a late stage and infectious, but a chest will not be plated to find disease early. In these cases one life only is in danger. The community sees people by scores and hundreds, not by ones and twos. The difference is quantitative.

Facilities for diagnosis, especially if more are to be provided, need to be de-centralized, to be brought nearer to the doctor and his patient. Their usefulness increases with nearness and decreases with distance. Ample facilities for diagnosis at Winnipeg would not greatly help Regina or Halifax. The late Dr. Gordon Bell thought the solution was in district diagnostic centres, half a dozen, say, scattered throughout the province, each with the chief essentials for laboratory aid to clinical diagnosis and an x-ray equipment not turning out as many small plants do one or two miserable unreadable bone plates a week, but covering the whole range of work in chest, intestines, genito-urinary tract, gall bladder, head, etc., and doing it well. Such service could be on the basis of cost, but given free when necessary, the aim being the widest possible availability and usefulness. It should not appear revolutionary to specialize the functions of a dozen or a score of men out of the six hundred practitioners of a province in order to provide this extended community service. Keen young men should be attracted by the fine opportunities of helping in diagnosis. Medical students might earn some of the means for their education by doing some of the technical work. Provincial hospitals such as mental hospitals and sanatoria could very well be among the first centres. Indeed some are already performing such functions for their neighbourhoods.

Such a centre within an hour or two of almost every doctor and patient would help not only the patient but the doctor. It is not snow drifts or mud holes that drive men out of country practice, but isolation and the lack of modern means of diagnosis and treatment. A diagnostic and conference centre on the very borders of his territory would change everything for a keen young doctor.

This may be the solution, or it may not, but means of diagnosis in our very hands, and yet not available for a tithe of sick people, is surely a challenge to the men of our profession, and to our whole social system.

What is true of equipment is true almost equally of the advantages of consultation. These are for the few; the many have to get on without them. Specialism has its seamy side, as we all know; the presumption of special knowledge without special study or experience; the narrowing of outlook until a specialist can almost cease to be a physician and degenerate into a factory piece worker; the same symptom complex getting a half dozen different diagnoses and as many treatments from as many specialists of limited vision; the spectacle of the seven blind men who each felt a different part, and one part only, of the elephant, and naturally could not agree in their findings.

But notwithstanding these difficulties, specialism there is, and still more specialism there must be, as medicine, wide as the Amazon already, broadens out into the larger ocean of to-morrow. What

we have drifted into has not been specialism but individualism. A cavalry squadron alone or a corps of engineers alone, however well equipped, would not get far in modern warfare. We have learned how to divide up for special study and experience and function. But we have not learned how to co-ordinate special study and experience and function, and bring it all to bear on the problems of the single patient. So some of us miss the more intensive views we need to get, and some the more extensive views we need to keep. We lose all round.

It is true that in certain centres—in the public wards of the larger hospitals—there is a very fair co-ordination of general and special viewpoint and experience. But the remaining thousands of doctor-and-patient clinical units throughout city and country, what of them? How many have similar advantages? Of course, a patient may travel a few hundred miles, without his physician, pay half a dozen fees in a half dozen offices for a half dozen unco-ordinated examinations, and live to tell the tale to his doctor at home—also to his banker. Unsatisfactory as they are it is only the very few who can have even such advantages as these.

When ordinary modern means of diagnosis, and ordinary advantages of special experience—such as you and I want when we are ill—are available for one in a hundred only, of the sick, or even, peradventure, for one in ten, is it not time to consider all over again the ways by which medical science should be applied to the people's needs? Is our individualistic hap-hazard system of medical practice the best possible for the people or even for us? Can such old bottles hold the new wine of living medicine? Must science as young as the aeroplane or the radio crawl out to its application among the people in obsolete chariot or stage coach?

Systems cannot be changed over-night; indeed, they have a way of changing themselves by gradual development, which is better. We can at least look squarely at our mediaeval plan, and get it well into our minds that this is no holy thing, no ark of the Covenant that it would be sacrilege to touch. Even the ogre we keep to frighten our naughty boys with, *State Medicine*, may not be so very fearsome when actually met and lived with. The physicians of Egypt, employed and paid by the state, five thousand years ago, were skilled beyond any others of the age they lived in. Those who practise something like state medicine to-day find in it a worthy calling, and do not always show the deterioration predicted for doctors on salary. Just why salary should be considered deleterious to the moral and professional health of doctors I protest I cannot explain. And results of work? How long would it take our individualistic system of practice, dealing only with individuals who care to come to see us, to clear any community of yellow fever, or malaria, or hookworm, or the plague? Yet it is a comparatively easy matter for modern medical science, working through community organization, to clear any one community of any one of these.

Better organization of the care of the sick would mean not only better and more effective work for men of our training, but actually more of it. What might be done that is not now being done for the good of the people is a field white to the harvest in which we simply stumble over one another with our sickles and our handfuls, while much that might be saved of life and health is lost.

D. A. Stewart

INTERNATIONAL SANITARY INTERESTS

PERHAPS there is no more impressive demonstration of the brotherhood of man than the nonchalance with which the average "national" communicates his infection, without fear or favour, to all and sundry other nationals with whom he indulges in contacts. Could there be a better exemplification of the practical

application of the principle of give and take? While at divers times the results of such unrestricted reciprocity have been most disastrous, as witness the great epidemics of the middle ages, it is only comparatively recently that nation has arisen against nation in the endeavour to prevent widespread dissemination of infection through routes of trade and travel. The earlier efforts at international control were productive of inconsequential results, as might have been expected before anything definite was known about the *contagium vivum*. Fortunately, knowledge in this particular came in time to be of service when the newer facilities for travel made possible the great and rapid redistribution of population, which has been so general of late years. Although international conferences have been held, since 1852, and conventions of greater or less promise have been agreed upon, it was not until 1903 that really concerted action was taken. In the latter year, at the instance of the Italian government, a conference was held at Paris for the purpose of compiling the provisions of then existing conventions with such modifications as scientific progress indicated. The object in view was to permit of all possible freedom in commerce compatible with public health interests. At this conference the *Office International d'Hygiene Publique* was created with a permanent committee composed of a representative of each of the Powers which was a signatory to the convention completed later (1907) at Rome. To this convention there were at first but two extra-European signatories, the United States and Brazil, although subsequently other western countries entered into the agreement. The principal duty of the *Office International* was declared to be to collect and transmit to the participating states pertinent information concerning public health, and "especially regarding the infectious diseases, notably cholera, plague and yellow fever, as well as the measures taken to check these diseases."

In the Covenant of the League of Nations there is included an article which empowers the League to deal with public health matters of international concern. Several members of the Health Committee of the League felt that the permanent committee of the *Office International* might well act as the organ through which the health activities of the League should be executed. This would seem a reasonable way of avoiding duplication of effort, but as the United States had refused to join the League, and as France objected to the proposal, it was decided that some agreement should be reached which would permit of co-operation between the two organizations. The matter came up for discussion at the International Sanitary Conference held at Paris in May of this year, when it was unanimously agreed that it was desirable that the *Office International* should restrict its activities to the diseases named in the Rome convention, but that its duties should be extended to include investigation of the efficiency and activity of the signatory Powers toward the elimination of these diseases from their ports. At no previous conference was it possible to secure agreement in respect of such investigation, which some delegates regarded as equivalent to manifesting lack of faith in the *bona fides* of the various signatory Powers.

In June last, the Health Committee of the League of Nations met at Paris, when further consideration was given to this matter. It would appear from the report of this meeting that an agreement was reached relative to co-operation between the Committee and the *Office International;* that regional bureaux of the League should render all possible assistance by forwarding to the *Office* notifications respecting communicable diseases; and that the *Office* should be delegated to forward such information to the diplomatic agencies in Paris for transmission to their respective governments.

From the various discussions it is apparent that some of the nations are very sensitive about what may have the appearance of meddlesomeness, that all are jealous of any possibility of unnecessary interference with their trade relations, and that many matters must be

dealt with very tactfully. There has, of late, been some dissatisfaction with the functioning of the *Office International*, where there has been doubt as to what should be done under somewhat embarrassing circumstances. It is evident that there is a sincere desire to develop an effective method of dealing with health problems of international import, and it is gratifying to note a growing readiness of the nations to co-operate in bringing about a consummation so devoutly to be wished for. It may be assumed that the Health Committee of the League will busy itself with matters which have not been assigned to the *Office International*, and that such harmonious relationship will prevail between the two organizations as will assure competent handling of all international problems which have a bearing on the public health. W. H. Hattie

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ON THE HOSPITALS OF CANADA

THE hospitals of Canada have been listed and mapped and their beds enumerated in a recent publication of the Department of Health, Ottawa. Bare statistics only, not a word of comment.

Territorially considered these hospitals dot the map all the way from Glace Bay and Sydney Mines, Cape Breton, to Alert Bay, Bella Coola, Prince Rupert and even to Massett in the Queen Charlotte Islands. From Windsor and Chatham, Ontario, in the latitude of Boston and Chicago, they scatter thinner and thinner up almost to the edge of the Arctic circle at Fort Smith, Fort Vermillion, Fort Simpson, Atlin, White Horse and Dawson City.

Statistically considered, the grand total of beds reaches twenty-eight thousand, in hospital groups all the way from the General Hospitals of Vancouver, Toronto and Winnipeg with 900, 750 and 650 respectively, and the Royal Victoria and St. Boniface (Manitoba) with 500 each, down to the class of the Amaranth "public hospital" somewhere in the wilds of Manitoba holding the frontier against disease in its district as best it can with one bed only, or several "private hospitals" in which Mrs. A, or B, or C turns an honest penny by having an obstetrical case in the spare room.

A historical consideration also would be worth while, with places of honour for the Hôtel Dieu of Montreal, and the successor in modern Quebec of the still earlier hospital there, with their three centuries of service.

Of kinds, there are listed three only, public, private and "Red Cross outpost." Strange to say none of the very fine mental hospitals or sanatoria of Canada (except the "Preventorium" at Toronto) are mapped or even mentioned. Doubtless, it is intended to list these by themselves later, but why the separate compartments? Are not these also hospitals, guest houses for the sick, "places in which sick or injured have medical or surgical care" (Webster)?

There was never any difference in essentials between sanatorium and general hospital, and every year brings them closer together in methods and aims. General hospitals are becoming sanatorium-ized in their wider use of such natural advantages as fresh air, sunlight and more prolonged rest; sanatoria are becoming general-hospital-ized in the broadening and deepening of the scope of their work in diagnosis and treatment. The changes are good for both. They provoke one another usually to love, but, at any rate, to good works.

A well equipped sanatorium gives diagnosis and treatment in tuberculosis, both pulmonary and non-pulmonary, including the orthopædic care of bone and joint disease. It gives diagnosis and treatment in diseases of bronchi, lungs and pleuræ, both tuberculous and non-tuberculous, including among these the many and varied conditions of septic origin. It finds places sometimes to give a period of rest in bed to a few worn out people or

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to "heart cases" who need pretty much the same routine as the sanatorium patients proper. Most sanatoria receive for diagnosis several hundreds of various cases each year, and likely offer their diagnostic facilities to their neighbouring medical men for cases of all types. The sanatorium is not a shack in the woods, nor the mental hospital a bedlam, but both are modern hospitals. Department of Public Health please take notice.

D. A. S.

COLOUR-BLINDNESS

IN 1922 was published the first part of *Anomalies and Diseases of the Eye*, one of a series of volumes appearing under the title of the *Treasury of Human Inheritance* and edited by Karl Pearson, F.R.S. This special volume was published as the *Nettleship Memorial Volume*, and contains a record of Nettleship's own work and that of his immediate students and friends. The second part is devoted to colour-blindness and has recently been published by the Cambridge University Press.*

The authoress, Dr. Julia Bell, introduces the subject in a brief historical sketch and then proceeds to its discussion under the headings of normal colour-vision, congenital total colour-blindness or achromatism, and congenital colour-blindness or dichromic vision.

The credit of the earliest observation of colour-blindness appears to belong to Dr. Tubervile of Salisbury, who, writing in 1684, states that "A maid, two or three and twenty years old, came to me from Banbury, who could see very well, but no colour beside Black and White." A few other instances were recorded in the course of the next hundred years, but it was not until 1794 that Dalton, observing the anomaly in his own vision, inaugurated an epoch of research into colour-blindness and into colour-vision itself. He tells us how his attention was drawn to the subject: "I was always of opinion that several colours were injudiciously named. The term pink in reference to the flower of that name seemed proper enough; but when the term red was substituted for pink, I thought it highly improper; it should have been blue, in my apprehension."

Total congenital colour-blindness, an inability to recognize any tints but black, white, and grey, is rare, and is of interest chiefly in the relation it bears to certain symptoms that usually accompany it, more especially amblyopia and photophobia. Thus, in albinism, is exhibited a closely allied syndrome, except that in it colour-vision itself is retained. It would appear that in both albinism and achromatism the macular region is not functioning, and that vision is carried on in the peripheral areas of the retina; but that in achromatism the spectrum is identical with that seen by the normal eye under the condition of dark adaptation. It is possible, therefore, that achromatism is due to the fact that light stimuli from any wave-length produce vibrations affecting too wide an area of the retina, and thus tend to bring about a sensation of all colours, and so of white and grey.

Hereditary influences play a limited part in the causation of congenital total colour-blindness, for about twenty per cent of all recorded cases appear to have no similarly affected relatives, and show no other hereditary defects. On the other hand, a high proportion of cases are the offspring of consanguineous parents, and this factor is of significance.

The more common form of colour-blindness, dichromatism or congenital colour-blindness, is strongly inherited, belonging to that group of inheritable diseases, which is mainly manifested in

* The treasury of Human Inheritance. Edited by Karl Pearson, F.R.S. Eugenics Laboratory Memoirs, XXIII. Francis Galton Laboratory for National Eugenics, London. Volume II: Anomalies and Diseases of the Eye (Nettleship Memorial Volume). Part II: Colour-Blindness. By Julia Bell, M.A., M.R.C.S., L.R.C.P., Cambridge: The University Press; London; H. K. Lewis and Co. Ltd., and Wheldon and Wesley, Ltd., 1926.

males and transmitted by their unaffected daughters, not by themselves but directly to their sons. Only ninety-one cases of its occurrence in the female are on record. Controversy has centred around the question whether the mental picture normally stimulated by yellow and blue does in fact correspond to the two colours seen by dichromates. It does not, according to the theory of Edridge-Green, who holds that in the evolution of colour-vision the first two wave-lengths to be differentiated as colours are those at the extreme ends of the spectrum, and that the power to react specifically to stimuli from these regions is what is retained by the dichromic eye. Dr. Julia Bell finds difficulty in accepting this conclusion. Careful examination of what appear to be genuine congenital cases, especially cases of unilateral colour blindness, seems to leave little doubt that the two retained fundamental tones are yellow and blue. Other characteristics of dichromic vision are its persistence, its frequent association with perfectly normal vision for form, and an enhanced sensibility for gradations of light and shade. The colour sense also appears to be definitely changed in character under artificial light.

S. O. McMURTRY

EMOTIONAL REACTIONS IN DISSEMINATED SCLEROSIS

WE publish in the present issue an interesting presentation of the early signs of Disseminated Sclerosis, in which Dr. Fisher makes reference to the emotional symptoms often exhibited by patients suffering from this disease. As still further emphasizing the importance of abnormal emotional reactions in the diagnosis of this disease we would call attention to a paper which appeared recently in the *Journal of Neurology and Psychopathology*,* on the affective symptomatology of disseminated sclerosis, by Dr. Cottrell and Dr. Kinnear Wilson, in which they state that affective symptoms in this disease may be observed more frequently than any other single symptom, such as nystagmus, scanning speech, tremor, spasticity, etc. These writers state that abnormal emotional reactions may be exhibited in three directions; in changes of mood, in changes of bodily feeling, and in changes in emotional expression and control. In 100 per cent of these cases an alteration in the prevailing mood of the patient may be observed. In 63 per cent an increased sense of mental well being was noted, for which the authors suggest the phrase *euphoria sclerotica* to indicate the state of ease and serenity or even gaiety observed in these patients. The phrase *dysphoria sclerotica* is suggested to indicate the state of mental unrest and disquiet which was met with in 10 per cent of their cases. In 25 per cent an increased variability of mood was noted, in which the patients were subject either to abrupt transitions from a mood of sadness to one of euphoria, or from euphoria to sadness. In only two cases did the authors observe an indifferent and stolid reaction as the only change in emotional attitude. The sense of physical well being (*eutonia sclerotica*) which the authors noted in 84 per cent of their cases led them to consider that this state must be accepted as one of the fundamental symptoms of disseminated sclerosis. It was observed not only in the early but in the late stages of the disease, and wa often in striking contrast with the actual physical incapacity of the patients concerned. Thus a patient who was almost moribund declared that physically she felt all right.

A similar though much more extreme eutonic state is of course recognizable in general paralysis of the insane. Here, however, the patients actually believe themselves possessed of unusual physical power; a lack of appreciative insight due doubtless, to the fact that there is considerable intellectual deterioration—a condi-

* *Journal of Neurology and Psycho-Pathology*, July, 1926, London, The British Medical Association.

dition very rarely observed in patients with insular sclerosis. The latter feel well, but are quite conscious of the fact that they are in a crippled state.

The exaggeration and facility of outward emotional expression in disseminated sclerosis is regarded by the authors as a symptom of immediate diagnostic value. When a young person responds to simple routine questions by gratuitous and uncalled for smiles and laughs, disseminated sclerosis becomes a diagnostic probability. In some cases this undue affective display is one of the earliest symptoms of the malady. In one instance while a depressed patient was recounting thoughts of suicide which she entertained her face was wreathed in smiles and she frequently burst into uncontrollable laughter. Apart from its purely clinical interest this contribution adds to our knowledge of the neuropathology of emotional disturbances. As regards the pathogenesis of these symptoms it is considerd that like the somatic symptoms they probably arise from an invasion of the cerebral mechanisms by a toxic agent.

SIR JAMES MACKENZIE*

DR. MACNAIR WILSON has presented the profession, and the reading public generally with a delightful biography of Sir James Mackenzie, M.D., LL.D., F.R.S., F.R.C.P. (Aberdeen and Edinburgh). Like many of his famous compatriots Sir James Mackenzie came of good Highland farming stock. Born at Scone in 1853, he was educated at Perth Academy, and before he left, he is said to have wondered why his teacher set so much value on memory, and so little on the reasoning powers. Attracted by the coloured jars in a chemist's window, he determined to become a chemist, but he was soon disillusioned by the many duties he was obliged to perform, and the length of his working hours which greatly interfered with his studies; twelve hours each week day excepting Saturday when they were fifteen. He had a long wearisome walk home every night, but his mother always had a lamp in the window so that he might see the sign of welcome a mile or so away. Promptly, at the end of his apprenticeship he entered Edinburgh University as a medical student, and after obtaining his degree he became assistant to a medical partnership in Burnley with residence in the home of the senior partner. This was in 1879. In the course of his practice with this firm he met with the case which was to give an aim to his life's work: a young mother dying in childbed as the result of heart disease. The thought lay heavily on his mind, that if he had had a wider knowledge of heart affections he could have averted the tragedy. He read every book and paper on heart disease, and took hundreds of tracings of the arteries with a Dudgeon sphymograph and of the venous pulse in the neck, using at first only a filament of straw stuck on the skin over the vein, which was so arranged as to mark its movements on smoked paper— a crude device, but this was followed shortly by an ingenious polygraph devised by himself. Years of study convinced him that every murmur of the heart was not necessarily a sign of disease, and that a heart, in which even disease was present, could do its work well so long as it was not overdriven. Of the arrival of this Burnley practitioner to London and of the welcome given him by the College of Physicians and the Royal Society, an interesting account is given by Dr. Wilson who also details, not without signs of bitterness, the many obstacles placed in his path by some of the older practitioners, who failed to appreciate the worth of this Scotsman, to some extent an unpolished diamond. Mackenzie's experience was similar to that of all pioneers; their discoveries are

* The Beloved Physician: Sir James Mackenzie. A biography by R. Macnair Wilson, London. John Murray, 1926, Demy, 8 vo., 316. One portrait.

often questioned and sometimes denied. The profession, however, has to be thankful that Mackenzie was a first rate fighting man, and was always able to defend his statements. There is no doubt that many of his views were at first difficult to grasp, and his presentation of them was often very dogmatic.

Many of the personal details given regarding Mackenzie's life are extremely interesting. Dr. Wilson is a hero worshipper, and the reader is put in possession of the many problems which confronted his hero, and of the various devices employed in solving them. Readers will, we are sure, enjoy the personal details of the doctor's life in Burnley, first in residence with the senior partner and later in his own home at Bank Parade. His marriage which took place in 1887 was apparently a very happy one. Life in London, however, does not appear to have been very congenial to the Scotsman, so at the height of his fame, he determined to retire and go to St. Andrews, where he founded the St. Andrews Institute of Clinical Research, which remains not only as a memorial to his name, but also to the fundamental idea on which he insisted throughout all his later years, that to understand disease, its beginnings should be carefully studied over a long course of time. By such means he hoped to find out the laws which govern the production of symptoms in all forms of chronic disease. He believed that such laws existed and ought to be discovered.

He died from an attack of angina pectoris. His was a life which certainly left the profession of medicine on a higher plane of thought than when he first took up its studies. He was ever an earnest worker, a great controversialist, a good friend, a most helpful teacher, and one who strove to throw all possible light upon the many dark places in medicine. His biography is written by one who loved him and admired his genius and earnestness.

A CRYSTALLINE FERMENT

WE are accustomed to speak of internal secretions, of vitamins, and of ferments as powerful factors in the processes of life, but our thoughts of them, tend to be of things intangible, present in certain tissues, in certain secretions, but scarcely concrete, though the results of their actions be ever so definite.

Instead of indulging in this vagueness, ever useful when accurate knowledge is wanting, we must more and more learn to regard them as definite chemical compounds, which have not yet been isolated and studied as individuals, either because they are distributed in such minute amounts, or because they are so chemically alike to other compounds present with them that the inherent difficulty of effecting a separation has not yet been overcome.

Everything that will bring home to us the concreteness and individuality of these chemical compounds must therefore be emphasized. We may think of adrenine, a fairly simple compound, as a typical internal secretion. We must now regard vitamin D as a close chemical relation of cholesterol. And we have now a means of obtaining a pure enzyme —of preparing a ferment in absolutely pure crystalline form, and of studying its chemical properties accurately.

This we owe to the nine years' labours of Dr. James B. Sumner of Cornell University Medical College.* After endless attempts to concentrate *urease* he has found an eminently simple procedure. Jack bean meal is extracted with a mixture of acetone and water in very definite proportions, and the extract is cooled for twelve hours at a temperature

* J. B. Sumner, "The isolation and crystallization of the enzyme urease," *J. Biol. Chem.*, N. Y., 1926, lxix, 435; "The recrystallization of urease," *ibid.*, lxx, 97.

just above the freezing point of water. Urease crystallizes out in amounts sufficient to be centrifuged and examined. The crystals are minute octahedra, colourless, and from four to five microns in diameter. The compound behaves generally as a globulin, and gives all those colour reactions which indicate that it contains the radicals of tyrosine, phenylalanine, tryptophane, and cystine. It has been successfully recrystallized.

It is so powerful that it will hydrolyse a urea solution at 20°C. to produce 120 times its own weight of ammonia every five minutes. At this temperature the ferment requires 1.4 seconds to decompose its own weight of urea.

We have, therefore, the most definite evidence of the concrete chemical individuality of one of the most widely distributed ferments in the plant kingdom. It is only a matter of time and chemical ingenuity before many other plant and animal ferments will also be obtained in the same pure form.

A. T. CAMERON

Editorial Comments

THE VALUE OF MALARIAL THERAPY IN DEMENTIA PARALYTICA

A preliminary report has been issued by the London County Mental Hospital Service (*Brit. M. J.*, Oct. 8, 1926) on the results of three years malarial treatment of general paralysis in the various mental hospitals of the London County Council. In order to furnish comparable evidence as to the frequency of remissions in untreated cases, the statistics from four of the London County Council mental hospitals for the three years immediately preceding those considered in the report have been obtained, and used in the comparison. This is in some degree a guarantee that no important change of adminisrtative policy enters as a factor into the results obtained from the malarial treatment, which have been summarized as follows:

Malarial therapy produces a greater number of remissions, and a smaller death rate than occurs in untreated cases.

Complete remissions under malarial therapy occur in about one-third of the cases in a mixed series, but in a much greater proportion if only cases with histories of dementia paralytica of less than eighteen months are treated.

The addition of neosalvarsan to the febrile treatment decreases the death rate among the cases unfit for discharge and increases the number of complete remissions that occur.

All the medical officers are agreed that in a majority of the cases treated by malarial therapy a marked improvement in general well being, cleanliness and conduct is observed.

POLIOMYELITIS AND POLIO-ENCEPHALITIS

We note from a recent editorial in the *Lancet* that the increase in the number of cases of poliomyelitis and polio-encephalitis has been larger this autumn than usual in many of the counties of England. An outbreak has taken place in Leicester where seventy-three cases have been reported up to the present, and in the week ending October 16th, sixty-two new cases of acute poliomyelitis and sixteen cases of acute polio-encephalitis have been reported throughout England and Wales. A circular from the public health office states that no more than one case has been reported in any one house, but great difficulty is met with in tracing any connection between the several cases. The disease is probably carried from person to person, and infection would appear to enter the system through the nose and mouth, but few facts have been ascertained. So far as is known it is not carried by water or milk. A warning is issued in places where the disease appears to assume an epidemic form preventing the gathering of children together. No child should be allowed to enter any house where there is a case of sickness. The sick should be isolated from the healthy, and if strict isolation and nursing cannot be obtained at home the patient should be treated in an isola-

tion hospital. Those who have been in contact with the sick should be isolated for three weeks. Such individuals are advised to disinfect nose and throat by some antiseptic spray.

In this connection we note that the Scottish Board of Health is endeavouring to arrange some method of dealing with cases of encephalitis lethargica. The Glasgow parish council has offered sixty beds in an excellent hospital at Stovhill. When accommodation is wanted the medical officer of health applies to the Board and forwards a medical report with sufficient detail to enable the Board to judge how suitable it is for admission. At present the numbers in this hospital are rapidly approaching to a hundred, and there is still a long waiting list in Glasgow. The hospital cases are in charge of a visiting neurologist, who is also responsible for the mental observation wards, and the records and results of this institution will prove of value in the study of a disorder that must still be regarded as a puzzle. Often the sequelæ seem to be the only proof that an alleged attack of influenza or other similar infection was really one of encephalitis. The disease is creating a troublesome problem, and the notifications though only few in number compared with those of the leading infections are still very considerable.

PROHIBITION'S FAILURE IN NORWAY

Hard as one may try to discern the truth in the contentions of both sides in the prohibition dispute in this country, the issue remains obscure in many respects. Overzealousness on both sides is responsible for many exaggerations, and the conclusions drawn from so-called facts are invariably coloured by *a priori* judgments. The propaganda on both sides has been of such a prejudiced character as to leave the neutral observer uncertain of the side on which the evil is the greater. This obscurity is absent when prohibition is regarded as an abstract issue, as it appears to have been in Norway where it has been defeated by a popular majority after a trial of seven years. The following facts come to us uncoloured by party interests: (*American Medicine*, October, 1926, 623). The law became effective in 1919. Difficult of execution, severe measures were added in 1920, 1921 and 1922. With the addition of each restraint, however, the situation became worse. The actual consumption of alcohol during this period decreased, but the problems of alcoholism increased. There were more arrests for drunkenness than before prohibition, there were more cases of acute alcoholism in the hospitals, and there were more crimes due chiefly to excessive drinking. In 1922, the Norwegian Government, realizing that prohibition was, in its essence, a mistake, began to repeal restraining measures. The result was that the consumption of alcohol *increased*, but the arrests and disorders *decreased*. Further legal indulgence was tried, and again consumption increased and disorders decreased. The figures are eloquent. In 1923, 3,700,000 litres of wine were imported and the arrests for drunkenness per thousand were 42.9. In 1924, 6,500,000 litres, almost double the consumption, and 37.4 arrests, a marked decrease. In 1925, 9,300,000 litres, and a still further drop in arrests to 32.6. Now it was becoming perfectly manifest to the Government that sobriety increased with the decrease of restrictions and that drunkenness increased with the imposition of restraints. It was not long before both the Government and the people realized that prohibition defeated its own purposes, and that sobriety and temperance had nothing in common with prohibition. The result was the recent vote, in which a heavy majority was shown in favour of the repeal of the law, a proved failure.

ANTI-MALARIAL MEASURES

Of the various enterprises usefully carried on under the auspices of the Rockefeller Foundation, none have exceeded in practical value the work of the International Health Board in the study and control of Malaria. In Palestine during 1924, surveys were made which show that while the mosquito *Anopheles bifurcatus* breeding in wells and cisterns is the carrier of malaria in towns, the principal carrier in rural areas is the *Anopheles elutus*. In the towns much benefit has been derived from oiling the wells and cisterns but in the country districts, legislation will be required to compel the tenants of land to use means to check the breeding of mosquitoes.

Good work has been done also in Porto Rico, and promising results have been secured in

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Brazil by antilarval measures alone without the quininization of its inhabitants. Officers of the International Board in response to an invitation from the Government of Italy have made a general survey of the malaria position in that country as control hitherto had been confined to the distribution of quinine. At present the Government provides screened houses for its own employees. Research is to be carried on and afterwards further action will doubtless be taken. In Gibraltar, a mosquito campaign was undertaken last year. The common mosquito there is the *Stegomyia fasciata*. These develop in the rain water underground tanks of which there are a vast number. No anophelines were met with.

A special investigation by the Foundation has been made of the malarial problems in the United States, especially in Georgia. Of the three indigenous Georgian Anopheles it has been ascertained that the *Anopheles quadrimaculatus* is for practical purposes the sole vector of malaria. It frequents level land, and its imago when at rest is not elevated at an angle of 45°, the usual anopheline posture, but on the contrary lies flat, the culicine attitude. Its range of flight was discovered to be small. During the winter months when the temperature of the water is low the larvæ spend most of their time at the bottom of pools, where it is difficult to reach them.

These studies and enquiries made in various lands and under various conditions indicate the diverse character of the problems involved in the suppression of malaria. The habits of one mosquito may protect it from assaults which are lethal to allied species. The report of the Rockefeller Foundation is a caution to all engaged in anti-malarial campaigns that to ensure success patient research is necessary without which there can be no sure guidance to appropriate action.

ON SYMPOSIA

The tendency in our Association meetings towards prearranged joint discussions on some special subject is we believe a good one, and seems to be gaining favour, while the independent paper followed as it generally is by a few haphazard and complimentary comments is going out of fashion, although of course there will always be individual records of new work and the reporting of interesting and instructive cases with specimens. The plan of arranging symposia on important subjects has been gathering strength for some years at our annual meetings, and was a conspicuous feature at Victoria and at Nottingham. Such symposia bring the general practitioner and the specialist closer together. The main points to be considered to ensure success are a good topic, well chosen speakers, and a capable chairman, while as an adjuvant the circulation beforehand of abstracts of the papers to be read often helps to keep subsequent speakers to their subject. The *British Medical Journal*, Oct. 2, 1926, states that at the end of the last session a conference of the presidents of the various sections of the Royal Society of Medicine took place at which it was decided to present such special discussions at all their stated meetings. We understand that the calendars of the society present a list of subjects agreed upon. We recommend this procedure to our Canadian readers.

VACCINATION BEFORE JENNER

The Jenner Centenary Number of the *British Medical Journal*, published on May 23, 1896, besides much other historical matter, included a note on the precursors of Jenner. The milkmaids in Gloucestershire and elsewhere had found out for themselves that cow-pox was a safeguard against small-pox before the insight and patient labour of Jenner transformed a piece of folklore into a scientic truth and made the medical profession all over the world receive it as such. Nor was he the first to inoculate cow-pox with the object of giving protection against small-pox. The first vaccinations of which there is any record were performed by Benjamin Jesty, a farmer of Yetminster in Dorset, who in 1774 inoculated his wife and his two sons, aged respectively three and two years. He himself had had cow-pox before by contagion from the cow. His vaccinations were successful, and his family remained proof against small-pox inoculation and contagion. Again, in 1791 Peter Plett, of Schönwaide in Holstein, successfully vaccinated some children. Neither Jesty nor Plett, however, seem to have followed up the matter; hence nothing came of their happy thought. They had a glimpse of the truth, but they passed away and left no trace. It was on May 14, 1796, that Jenner carried out his first

inoculation with cow-pox. The *British Medical Journal* of October 9th presents its readers with a photograph taken this summer, of the tombstones of Jesty and his wife at Worth Matravers in Dorset. The inscription on Benjamin Jesty's tombstone runs as follows: "Sacred to the memory of Benjm. Jesty of Downshay, who departed this life, April 16th, 1816, aged 79 years. He was born at Yetminster in this county, and was an upright honest man, particularly noted for having been the first person (known) that introduced the cow-pox by inoculation, and who from his great strength of mind made the experiment from the cow on his wife and two sons in the year 1774."

ALCOHOLISM IN AMERICA

There were 433 deaths from alcoholism among Metropolitan Industrial policy holders during the first nine months of 1926, with a death rate of 3.3 per 100,000. This is the highest death rate for this disease for any similar period since 1917. The rate for the corresponding period of last year was 2.9; the increase since last year was approximately 14 per cent. Cirrhosis of the liver which is closely associated with alcoholism, accounted for 863 deaths. Deaths charged to wood and denatured alcoholic poisoning numbered twenty-four during the nine months' period.

Since January 1, 1922, a period of four years and nine months, alcoholism has caused 2,090 deaths among Metropolitan industrial policyholders. Of these, 2,067 occurred among approximately sixteen million persons living in the United States, and only twenty-three among approximately one million Canadians insured in the industrial department of the company. More than half of the few deaths from alcoholism among Canadians, occurred in the Province of Ontario, which has approximately one-third of the number of persons exposed to risk in the Dominion. — *Statistical Bulletin, Metropolitan Life Insurance Co.*

We called attention in our last issue to a new synthetic remedy for malaria, "plasmochin", an alkaloid having certain genetic relations with quinine. It has been, we understand, carefully tested not only on animals but in the treatment of general paralytics, and more recently in the Hamburg Tropical Diseases Institute where 134 patients with malaria contracted in various countries have been treated during the past twelve-month. The results have been generally satisfactory, and it is now being tested in malarial cases in the Balkans and in Italy. In both these latter countries no relapses have occurred, but the period is *still too short* to be certain of a complete cure. Several cases of blackwater fever have also been treated successfully without any untoward results. Professor Muhlens and his colleagues state that plasmochin alone, and in some cases in combination with quinine destroys the crescentic sexual forms of the parasite, even of the severest tropical forms, and they hold the view that without crescentic carriers the spread of tropical malaria is impossible. It is to be hoped that future experience with this drug may prove these statements to be true.

We are pleased to announce the publication of a new book on the "Common Procedures in the Practice of Pædiatrics" by Alan Brown, M.D., Physician-in-Chief to the Hospital for Sick Children, Toronto, and Frederick F. Tisdall, M.D., Attending Physician, Hospital for Sick Children, Toronto. This it is hoped will prove a very practical new work for doctors, students of medicine, nurses, etc. It will present in detail the common procedures employed in the medical service of the Hospital for Sick Children. So many new methods have been introduced in recent years as to make such a book of great value to practitioner and student; all apparatus required and the actual steps of the different procedures will be described with great detail. It will be issued shortly by McClelland & Stewart, Ltd., Toronto.

Sir Rider Haggard who died last year at the age of seventy-nine, has left behind him an interesting autobiography. His father gave him a good grammar school education and he began active life at the age of nineteen as secretary to Sir Henry Bulwer, who had then been appointed to the Lieutenant-Governorship of Natal. During these years he had many varied and exciting experiences which served him well

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afterwards when on the staff of Sir Thomas Shepstone, special commissioner to the Transvaal. Shortly after Gladstone's bargain with the Boers after the defeat at Majuba Hill, he returned to England believing that such a treaty would lead to a long period of unrest and eventually to war, as it did. Although on his return to England he studied for the law he shortly took to writing stories and owing to their success he gave up the practice of his profession and went to live in Norfolk, the county in which he had been born, and here took a prominent place in public affairs, not only in those of his county but in the discussions on national and imperial problems. His interest in public life brought him in contact with our profession and led him to write *Dr. Therne*, the story of a young medical man who fell into the toils of the anti-vaccinators, and became a radical and anti-vaccinator. In the peroration to his volumes of autobiography Rider Haggard describes himself as a *lover of the kindly run of men, a lover of the land, and of all creatures that dwell therein, but most of all a lover of his country which with heart, and soul and strength he tried to serve*. May we all be able to describe ourselves similarly as we pass through into the unknown.

Miscellaneous

ON THE DEBT OF MEDICINE TO THE EXPERIMENTAL METHOD OF HARVEY*

A thoughtful and illuminating address was delivered by Sir John Rose Bradford on St. Luke's Day before the Royal College of Physicians in London. The subject chosen by the orator was more or less complemental to Sir Archibald Garrod's Harveian oration two years previously, on "The Debt of Science to Medicine." Sir Archibald in that oration pointed out that the debt of science to medicine was great, as nearly all the pioneers of scientific discovery after the awakening from the long sleep of the Dark Ages were medical men. The very term "physic" suggests the fact that for a long time the physician was the only scholar who studied physics in contradistinction to metaphysics. All the so-called physical sciences so far as they were then known, formed part of the study of the medical man. Even astronomy owed much to the profession, and at one time no physician was well equipped who was not able to cast a horoscope and to estimate the influence of the planets on his patients. Copernicus had a medical degree and practised as a physician, and Olbers who added to our knowledge of diphtheria, and was a winner of the Napoleonic prize for the best essay on that disease, discovered two planets and wrote many papers on astronomical subjects. There is therefore no room to doubt the correctness of Sir Archibald's statement that science owed much to the medical profession in the past. And yet since that renaissance of learning there has been an indisposition amongst scientists to admit freely that medicine is a science in itself; and there are those who deny that many of the observations and conclusions of Thomas Sydenham were as truly scientific as the experiments of Harvey, or of any contemporary man of science.

Sir John Rose Bradford in his address, claimed that Harvey's life work illustrated in a remarkable manner the many sided character of medicine when considered as a whole, and the fact that the men, who in the past have promoted its advance, have been as a rule men of wide attainments in many branches of knowledge. Harvey's greatness is shown by the fact that, notwithstanding the conditions of thought at the time, he was able to free himself from the traditions of the past, and the influence of authority and dogma, and lay the foundations of modern science by insisting on the fundamental importance of experiment, and of accuracy of observation. He considered that it was no exaggeration to say that the greatest and most valuable benefaction ever received by the college was Harvey's exhortation to its fellows and members to search and study out the secrets of nature by way of experiment.

The art of medicine must of necessity be reared as a superstructure on the science of medicine, and unless medicine is to be indistinguishable from mere empiricism, the science of medicine like other sciences can only be

* Harveian Oration on *The Debt of Medicine to the Experimental Method of Harvey*. Delivered before the Royal College of Physicians, London, Oct. 18th, by Sir John Rose Bradford, K.C.M.G., M.D., D.Sc. Lond., F.R.S. (*Lancet*, Oct. 23, 1926.)

founded on and advanced by observation and experiment. The knowledge of the natural history of disease (the course and symptoms of an attack) is a subject of vast importance to the art of medicine, and can only be acquired by observation. Nevertheless as the late Lord Moulton has well said, "when we are reduced to observation, science crawls." If we are to treat a disease successfully we must know more about it than its mere natural history; that is, its course when it is allowed to pursue its career unchecked. Experiment as a method of furthering the progress of any given science is capable of achieving great results. To quote Lord Moulton again, "As soon as you can bring experiment to bear upon a subject you are free; but as long as you can merely observe, your progress is slow. Experiment is like cross examination. You can put the question you want, and nature will always answer it."

Experiment unfortunately is not equally applicable to all sciences, and it is obvious that in medicine its scope must necessarily be limited. This is one reason why the progress of the science of medicine has been slow, but another reason is to be found in the profound complexity of the problems that have to be solved. This complexity of the problems is apt to react on the mind of the physician and produce even in this rather materialistic age a tendency to regard the phenomena of life, and especially of disease, as scarcely subject to the same rigid laws of cause and effect, that we all recognize as binding in the physical world. If this belief, even in a modified form, is once entertained by physicians it causes a looseness of thought that is inimical to the real progress of medicine.

Harvey by experimental work, by clear thinking and by accurate observation laid the foundations of *physiology* as a science. Those who have followed in his path have added to his foundations, so that now no one seriously questions its right to rank as a science, and no one disputes the fundamental proposition, that in physiology as in physics like causes produce like results. In the past there has been much theorizing both in physiology and in medicine, often on insufficient data. The experimental method affords a certain and conclusive test of the inaccuracy of much work of this nature.

Clinical observations when carried out by a great mind and in strict accordance with scientific method have in the past achieved most striking results. Often however, great as they are, and accurate as they are, they lack the precision of detail that the experimental method is capable of supplying. A striking illustration of this is afforded by the history of the localization of function in the cerebral cortex. Here the fundamental work was done by that great clinician, Hughlings Jackson. From the study of a limited number of cases of hemiplegia, and a series of cases of fits, and by careful correlation of the phenomena observed during life and the lesions found post mortem, he was able to arrive at the conclusion that voluntary movements were represented in a certain area of the cortex. Nevertheless, subsequent experimental work gave precision to this statement, and supplied a mass of detail that greatly enhanced the original fundamental discovery. So much so was this the case, that many still think that cerebral localization was discovered by the experimental method, whereas the fundamental facts were really the outcome of clinical observation.

Other examples of the value of experimental work may be found in the history of our investigations regarding the cause of the beat of the heart. From the earliest times the beat of the heart has been looked upon as emblematic of life by poets and philosophers, and has always had an element of mystery and awe attached to it. No physician can deny that there is much of apparent mystery in what may be called the clinical course of heart disease. Careful clinical observations in the past led only to important differences of opinion among physicians of recognized skill and ability; the problems connected with it appeared so difficult and so complex that it appeared beyond the power of observation to solve them. Here the method of Harvey, of seeking the secrets of nature by way of experiment, shed a flood of light on the problems that had baffled those who confined their investigations to mere observation. It is moreover noteworthy that many of the men who in recent times remodelled our conception of the nature of cardiac disease by their discoveries of the etiology of the cardiac beat, were men who devoted their lives to the investigation of the facts of nature with no other object in view than that of adding to knowledge for its own sake. The discoveries of pure clinicians of recent years remarkable as they were for the acuteness of their observations, were largely dependent on the use made of the apparatus of the laboratory in the investigations of clinical problems. The polygraph and the electrocardiagram have given certain and accurate information, where previously other methods of observation led only to the assertion of views, explanations and theories.

The history of the development of our knowledge of fibrillation is singularly interesting as affording a striking example of the experimental method substituting a clear, definite and easily proved condition for what was previously a vague, indefinite and even intangible conception. Fibrillation was discovered by a physiologist who was attempting to ascertain where the beat of the heart had its

origin. He found in the course of his enquiry that on stabbing the heart with a fine needle a condition of what we now call fibrillation ensued. Sometimes this followed a single puncture, sometimes many were required. Later it was found that faradization of the exposed heart with a current of moderate intensity produced the same result. Sometimes this condition of fibrillation was transitory; in other cases it was permanent and death ensued. No one who saw fibrillation at that time suspected that it was a common condition in human heart disease. Still further, a rigid physiologist studying only the normal activity of the heart would scarcely be prepared to admit that the circulation in a highly organized mammal could be maintained when the rhythmical activity of the heart was so disorganized that auricular fibrillation was present. Nevertheless, clinical medicine proves that even in man such is the case.

It may seem strange also to assert that our present conception of the fundamental facts in the pathology of heart disease owe their origin to researches conducted by a physiologist, not a physician, on the nature of the muscular contractions in the umbrella of a jelly fish. Romanes in the '70s carried out a series of beautiful, but very simple experiments on the nature of the rhythmical contractions of the umbrella of a jelly fish, and was earnestly investigating the problem whether the wave of contraction was transmitted by the nerve plexus, or whether it was of purely muscular origin. He had very little apparatus beyond a pair of scissors and a simple recording lever working on a smoked surface. Nevertheless in the course of his work he discovered the fundamental fact that what is known as a 'block' was a phenomenon dependent purely on muscular changes, and produced sometimes by the mere narrowing by section of the muscular bridge connecting two portions of a contracting muscular sheath.

Another striking illustration of the valuable results that may accrue from the experimental method of enquiry in furthering an increase in our knowledge of the nature of the heart beat, and indirectly of all vital activities, is afforded by Ringer's work on the effect of minute quantities of calcium, potassium, etc., on the heart, by which he proved that the activity of the living tissue was dependent upon the presence of calcium, a discovery the full effects of which are only now beginning to be realized. Ringer's work is, perhaps, specially noteworthy inasmuch as it was the work of a man trained as a clinical physician, who did not embark upon experimental enquiries until he had reached middle life, and then devoted himself to the investigation of what may be regarded as abstract problems. In all these experiments Harvey's exhortation was fulfilled to the letter—in searching and studying out the secrets of nature by way of experiment. To-day *Medicine* founded on knowledge obtained by exact observation, defined and verified by experimental investigation, may claim to be recognized as a true science.

The cause and prevention of distemper in dogs has received a great deal of attention in Europe and America. Appeals are being made for support of this work. A well equipped hospital has been built outside of London and has been in operation for some time, and some of the most famous research workers have associated themselves with the work, amongst them being Drs. Gye and Barnard and Dr. Theobald Smith. It seems to be proven that the cause of distemper belongs to the ultra microscopic group of organisms. The next step is the working out of a serum that may confer immunity from the disease.

Correspondence

Our London Letter

(From our correspondent)

Opening of the winter session.—The month of October is a very busy one for London hospitals and medical schools as the opening for the winter session is made the occasion for the annual prize giving in most instances, and dinners for old graduates and friends also take place round about the same time. Certain hospitals organize short "refresher" courses for the benefit of the old graduates who have come to London in connexion with the functions mentioned above. This year Middlesex Hospital gave a course of lectures and demonstrations from September 30th to October 3rd and St. Mary's Hospital gave a short course on October 2nd, 3rd and 4th. Of the various addresses delivered at the opening of the session, that by Dr. Graham Little, M.P., at St. George's Hospital on "The medical profession and the public" attracted most attention in the press, but for wealth of sound advice to medical students and young graduates Sir Humphry Rolleston's address at King's College Hospital on "Professional careers" takes easy precedence. Sundry items of news of some importance are as usual allowed to leak out on

these occasions. Thus it was reported that a completely new and separate Biochemical Institute is to be built at the Middlesex Hospital through the generosity of Mr. S. A. Courtauld, who has given £30,000 for this purpose. At St. Bartholomew's Hospital it is proposed to rebuild the medical school on an adjoining site at a cost of £140,000. At the Royal Free Hospital (London School of Medicine for Women) a new children's ward is to be opened and a Chair of Physiology endowed. The Royal Westminster Ophthalmic Hospital is to be rebuilt on a site in Broad Street, and Charing Cross Hospital is to extend its premises on to the site at present occupied by the eye hospital.

Small-pox in London.—October has seen an outbreak of small-pox in London: two cases occurred in Willesden, a northern suburb, where a man and his wife, who had lately been in Paris, were found to be suffering from the disease. The husband, who had been vaccinated in infancy and successfully re-vaccinated some years ago, recovered, but his wife, who had not been vaccinated since infancy, died. These two patients had stayed at an hotel in the metropolis and an attendant at this hotel was reported to be suffering from small-pox. A case also occurred at the Royal Northern Hospital necessitating very strict quarantine regulations, but up to the time of writing there have been no further cases reported.

Hospitals and the coal dispute.—The advent of the colder weather has added to the difficulties already created by the dispute in the coal trade and serious anxiety is felt by the authorities of many of the London hospitals. When it is realized that a large institution like the London Hospital requires 150 tons of fuel each week it will be seen that even a moderate shortage in the supplies will quickly lead to difficulties, and further the foreign coal, upon which certain hospitals have now to rely, does not appear to be so efficient in keeping the important central heating apparatus at work as the usual English variety.

International nurses' training.—An enterprise in London which deserves to be better known is the International Course in Public Health Nursing which has just commenced its seventh year. This course was started in 1920 to meet the growing need in many countries for nurses qualified to work in the public health field. The course is organized by the League of Red Cross Societies and is given at Bedford College for Women, a college of the University of London. As a result of subscriptions from various Red Cross societies an "International House" has recently been opened at 15 Manchester Square, London, which serves both as a hostel for students of the course, and as a club for all foreign nurses living in or visiting London for short periods. The aim is to give qualified nurses from different countries a training in public health work so that they may be able to go back and help in the organization of such public health services as their national Red Cross societies see fit. In 1924 an additional course for nurse-administrators and teachers in schools of nursing was begun. The theoretical and practical sides of both these courses have been carefully worked out, the language difficulties are largely overcome by a preliminary two months spent in England and at the end of the course visits to European centres are usually arranged. The course for 1926-27 contains twenty students, one of whom is from Canada.

ALAN MONCRIEFF

London, November, 1926.

Our Edinburgh Letter

(From our correspondent)

On October 10th, the Duke of York, who was accompanied by the Duchess, formally opened the new radiological department at the Royal Infirmary. The royal visitors were welcomed by the Lord Provost, Sir William Sleigh, and various members of the management and teaching staff of the institution. X-ray work in Edinburgh began in the Royal Infirmary under Drs. Milne Murray and Dawson Turner in 1898. The first x-ray photograph was taken on October 14th and in the course of the following year 600 x-ray examinations were made. Last year 23,000 examinations were made. It has now been decided to appoint a full-time radiologist, who will also conduct the teaching of radiology. Dr. Woodburn Morison has been appointed and will also hold the appointment of lecturer on radiology to the university. The total cost of the new building is estimated at £52,000 of which the Red Cross Society has contributed £15,000. The new department is believed to be one of the finest in Britain, if not elsewhere. Radiology is now taught as a definite subject to undergraduates, and a diploma D.R., Edin., has been instituted.

The Caledonian Medical Society held its annual meeting at Storrs Hall Hotel, Windermere, on September 24th. Dr. W. E. Henderson, medical officer of health for Westmoreland, presided over a large company. Sir Robert Jones, Bt., F.R.C.S., Sir Samuel Scott, Bt., High Sheriff for Westmoreland, and Sir Alfred Ewing, K.C.B., LL.D., Principal of Edinburgh University were elected honorary members. This Society has an interesting history. It was founded one night forty-eight years ago by three highland medical students with the object of promoting social intercourse and encouraging an

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interest in things celtic and medical. The three pious founders were shortly joined by four other undergraduates, and a magazine was produced which at first was entirely in manuscript. Meetings were held at different members' houses and papers were read and discussions took place. Sir James Mackenzie was one of the first who joined the society in those old days. In these early beginnings and in the acquisition of Sir James Mackenzie we might see a parallel in the birth of the Royal Medical Society, one of the best known of our academic institutions.

"This (latter) Society was founded in the month of August, 1734, and is the oldest medical society in the Kingdom. Six medical students after spending a pleasant social evening in a tavern agreed to meet once a fortnight in their respective lodgings, when one of them would read a dissertation in English or in Latin, while the others would criticize and discuss it. This group of six—Cleghorn, Cumming, Hamilton, Kennedy, Russell and Taylor—were within a few weeks joined by another whom they greatly rejoiced to count among the founders—no less celebrated a man than William Cullen. He more than anyone else served to make the foundations of the society sure."*

At one of the very early meetings of the Caledonian Medical Society Sir James Mackenzie read a paper on some question in relation to the heart. In the light of more recent days, it is of interest to know, that, in the discussion that followed, one of the other members remarked, that, whatever Mackenzie might know about other things he knew nothing about the heart. From small beginnings the society has grown to its present strength of close on 500 members. The magazine which appears four times in the year is unique among medical publications. In it are found articles grave and gay, bearing upon historical, archeological, military, social and highland aspects of medicine. The annual meetings are held alternately on different sides of the border, and are distinguished by the cheerfulness and friendliness of the proceedings. Included among the membership of the society are many distinguished people; among others, Viscount Finlay of Nairn, The Macleod of Macleod, Neil Munro, The Right Hon. Ian Macpherson, Sir Donald Macalister, Sir George Adam Smith, D.D., Sir Berkeley Moynihan. In 1928 the society will celebrate its jubilee in Edinburgh, under the joint presidency of Dr. S. Rutherford Macphail and Dr. W. Macnaughton, the two survivors of the three medical students who originally founded this interesting and enterprising club close on half a century ago.

An opportunity has arisen to do honour to the memory of Dr. David Livingstone. The humble home of the great African explorer and medical missionary at Blantyre, on the banks of the Clyde, is threatened with demolition. Close by are the school and the cotton mill to remind us of a life of heroic endeavour. Though the birthplace is situated in a populous centre, near the heart of Scottish industry, it stands in the midst of a scene that for natural beauty and historical and romantic associations might well vie with the shrines of Burns and Scott on Bonny Doon and Rolling Tweed. The ruins of the ancient priory of Blantyre are close by. Just across the Clyde stands Bothwell Castle, the stronghold of the "House of Douglas", with "Bothwell Brig" where the Covenanters fought with such sad success. The house is not an "auld clay biggin' " like Burns' birthplace at Ayr, but a three-storied tenement with outer rounded staircases. David Livingstone was born in 1813. At the age of ten, he left the village school to work in the cotton mill. By working after hours and attending night classes, he qualified at twenty-three to commence the college curriculum. In 1840 he was admitted a licentiate of the Faculty of Physicians and Surgeons of Glasgow. A strong committee has been formed including such representative names as Earl Haig, J. M. Barrie, and John Buchan, and is issuing an appeal for £12,000. It is proposed to purchase the house, to restore it to its original state, and to make it a permanent home for the many scattered relics of one of the greatest of Scotsmen.

A tablet to the memory of the late Dr. Claud B. Ker was unveiled on September 29th by Lady Sleigh, the wife of the Lord Provost, at the Edinburgh City Hospital. The present hospital which is an outstanding example of good arrangement and construction owes much of its excellence to him, as he was frequently consulted while the plans for it were being matured. Dr. Ker's contributions to medical literature are widely known and his reputation placed him in the forefront as an authority on infectious diseases.

In connection with the forthcoming meeting of the British Medical Association at Edinburgh in July, 1927, a committee has been formed to celebrate the centenary of the birth of Lord Lister. A book dedicated to Lister's life and work is being prepared. A public meeting will also be held at which addresses will be delivered by Sir William Watson Cheyne, Professor Caird, Dr. Harvey Cushing, Professor Tuffier (Paris), and Dr. Hamilton Russell of Melbourne. A museum will also be arranged and will contain some interesting relics of Lister, his life and times.

The session of the university commenced early

* Mr. Alex. Miles, Royal Medical Society, 1925.

in October. Inaugural addresses were delivered by several new professors including Dr. R. W. Johnstone, the new professor of midwifery and Professor Alfred J. Clark, the successor to the late Professor Cushny, in the chair of Materia Medica. Mr. John Galsworthy has succeeded Mr. G. K. Chesterton as President of the Associated Societies and has delivered his address "An unlearned address to students." The various political organizations are preparing for a rectorial election; the candidates being Sir John Gilmour, Secretary of State for Scotland (Unionist), Mr. Maynard Keynes (Liberal), and Mr. Tawney (Socialist). This week the university is immersed in the joys of the rectorial election with its usual boisterous accompaniments.

Recently when visiting the old red cathedral of St. Magnus, at Kirkwall in the Orkney Islands, I became aware of a brass tablet on the wall. "In loving memory of James Scarth Spence Logie, L.R.C.S.E., L.R.C.P.E., M.D., Ed., J.P., for sixty-five years an elder of this church, and for fifty-six years a medical practitioner in this town and county. Born in Kirkwall, 11th May, 1820, died 17th July, 1920. 'Blessed is he that considereth the poor. Psalm 41:1'." It might hardly be expected that doctors engaged in medical practice among the wild variety of weathers that mortify this inclement land would attain to great ages. Yet such seems to be the case. In 1922, there died at Campbelltown in Argyllshire, at the age of ninety-eight, Dr. William Gibson. He graduated M.D. at Edinburgh in 1854 with honours, and held public appointments for sixty-five years, retiring fourteen months before his death. It is told that when the war broke out, this gallant old gentleman of ninety-one signified his readiness to serve in any capacity to relieve a younger man for foreign service. Another distinguished veteran, Dr. William Barrie Dow, a member of the University Court and an LL.D., of St. Andrews, remained in active practice in West Fife until the age of eighty-eight. Longevity combined with vitality does not seem to be confined to any one area of Scotland. Dr. Muir of Selkirk, one of the best known doctors on the borders, who all his life has scorned the gig and motor car in favour of the saddle and push bike, recently performed the remarkable feat of pedalling 120.7 miles in one day, at the age of eighty-one.

GEORGE GIBSON

Edinburgh, Oct. 23, 1926.

THE RE-OPENING OF THE WELLCOME MUSEUM OF MEDICAL HISTORY

On Friday, October 14th, the re-organized Wellcome Historical Medical Museum, Wigmore Street, London, W., was re-opened with an interesting ceremony. The distinguished company were the guests of Mr. Henry S. Wellcome, the Founder and Director of the Museum; but the host himself was not present being detained on urgent business in the United States.

We were graciously received by Sir Humphry Rolleston, Bart., K.C.B., Regius Professor of Medicine at the University of Cambridge, and by Dr. John Comrie, Lecturer on the History of Medicine at the University of Edinburgh.

When the guests had been received, Sir Humphry delivered an address giving some account of the opening of the Museum on the occasion of the meeting of the seventeenth International Congress of Medicine in London in June, 1913. Sir Norman Moore, F.R.C.P., first President of the section of the History of Medicine at that congress, inaugurated the Museum in an exceedingly interesting speech subsequently printed and distributed by the generosity of Mr. Wellcome.

"The collections in this museum," writes the present conservator, Captain L. W. G. Malcolm, M.Sc., "are international in character and cover a wide field including medicine, surgery, chemistry, pharmacy, and the allied sciences. The museum is designed to represent the history of these various branches of the art of healing throughout the world, and their practice is illustrated by objects, instruments and appliances of historical interest and by plastic and pictorial art."

After Sir Humphry Rolleston had spoken, Sir Arthur Keith, F.R.S., Conservator of the Museum of the Royal College of Surgeons, delivered a suggestive address on the value of museums as records of history other than by the printed page. "A museum," said Sir Arthur, "tells its own story be it in terms of fossils, flints, stones, charms or amulets."

A vote of thanks to the speakers was proposed by Sir Frederick Kenyon, K.C.B., Director of the British Museum, who spoke of the immense value to culture which the money invested by the nation in museums represented. Sir D'arcy Power, K.B.E., the medical historian and author of the well known *Life of Harvey*, seconded the motion of thanks.

The rest of the evening was spent in looking at the exhibits now housed on a generous scale, and displayed in excellent light. The Museum lately acquired a large number of pictures and other objects relating to the ambulance and Red Cross activities in the Great War both on land and on sea. The special Lister exhibit attracted much attention. This consists of the reproduction of a part of the original ward in the Royal Infirmary at Glasgow, demolished in 1924, where Lord Lister first treated wounds on his antiseptic principles. Two beds, a door, a

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patient's chair, a bath, several tables, metal utensils for food, some early forms of the carbolic spray and many other objects in their original state have been acquired by the enlightened enthusiasm of Mr. Wellcome and of Dr. J. H. Teacher, Professor of Pathology, Glasgow University.

Here are also to be seen on loan many things that belonged to Lord Lister—his doctor's robes, his diplomas, congratulatory addresses, and his patent of nobility.

Overwhelmed as one is with the richness of detail and with the great scope of the collection, one cannot but be proud that London possesses the only museum of its kind—that of the complete history of the healing art throughout the ages.

D. FRASER HARRIS

London, October 16, 1926.

ELECTROTHERAPY IN SURGERY

To the Editor:

There is one vital omission in Dr. Gibson's article on acute arthritis published in the September number of this *Journal*. He writes lucidly of the types, etiology, pathology, signs, and symptoms, and banteringly of some remedial measures, *e.g.*, "Some of these after a solitary flutter as preliminary reports die from inherent lack of the right to live," but he has an unfaltering faith in standardized treatment. The article well repays a careful perusal in spite of the amazing omission of the indisputable value of electrotherapy in the treatment of acute arthritis.

The following three cases of acute arthritis—all physicians and surgeons—show the striking contrast between treatment by standardized surgical methods, and by that of electrotherapy. (1) Dr. A,. age eighty-nine; a severe strain followed by the classic signs and symptoms of acute arthritis of one ankle. Standardized surgical treatment for two months, but the aged veteran "began to smell the mould above the rose" from the loss of sleep and of appetite due to the increasing pain, swelling, and disability. Treatment by electrotherapy was begun at the end of second month. Autocondensation was given for fifteen minutes (800 ma.) followed by diathermy — one electrode below knee, the other on sole of foot. Prompt relief of pain and spasm followed, permitting free mobility of joint, with extension and flexion of foot. Treatment extended over a month—daily for a week, then tri-weekly, and weekly. No restrictions were placed on patient after first treatment, he could run to catch a street-car, if in a hurry. Two month later he said it was the better joint of the two. (2) and (3) Drs. S. and W., ages, seventy-five and thirty-five. Classic signs and symptoms acute arthritis of ankle joint. Standardized surgical treatment with loss of time, and with some relief from pain. Electrotherapy (diathermy) gave such prompt relief of pain, and permitted mobilization, flexion and extension of feet, that they were allowed to visit patients.

Readers of this *Journal*, not familiar with diathermy, may ask "How such results can be produced." The explanation is: first, diathermy is heat (conversive, not inducted) produced within the cells, fluids, and solid tissues, by electrons passing through at the rate of light—186,000 miles a second—and with oscillations of over 1,000,000 per second. Second, the heat thus produced dilates the arterioles capillaries, venules and lymphatics, removes stasis, and relieves pain, by removing pressure on the non-insulated terminals of the nerves, which convey the sensation of pain (physiologists tell us that all other nerve fibres are insulated throughout, but these are exposed as they enter the molecules of the tissues). Third, the sedative, and analgesic effects of heat relieve the pain and spasms, hence free mobilization. Fourth, restoration of functional activity soon removes waste, and morbid products and thus aids in the re-establishment of normal metabolism.

JOHN HUNTER

Toronto, November 8, 1926.

The iodine that is found in certain marine plants is 200 times as effective as inorganic iodides in its power to bring the thyroid gland back to normal. Dr. J. W. Turrentine, of the U.S. Bureau of Soils, who told of his researches at the meeting of the American Chemical Society, said that small doses of iodine-bearing substances coming from seaweed cured simple goitre. The symptoms of iodism that often result from using inorganic iodides were lacking and there were no disturbances such as result from taking thyroid gland preparations. It appears that the iodine is present in a colloidal form in the marine plants and is absorbed very slowly by the digestive tract. This lessens the chance of over-dosing. — *Science Supplement*, Sept. 10, 1926.

Men and Books

CALEB HILLIER PARRY AND SOMETHING OF HIS CONTEMPORARIES

By H. B. Anderson, M.D.

Toronto

In 1925 the British Medical Association met in Bath, enjoyed the hospitality of its citizens and the opportunity of learning something of the history, charm and interest of the place and its people. This ancient and beautiful city, in the eighteenth century, was inhabited or visited by many celebrities, one of them an eminent representative of our own profession, whose clinical acumen and scientific insight have given him an honourable place in medical history.

Caleb Hillier Parry—eldest of three sons and seven daughters of Joshua Parry, a distinguished and versatile noncomformist minister; was born at Cirencester in Gloucestershire in 1755 and died at Bath in 1822. It is of interest to Canadians to know that Dr. Thomas Rolph, father of the Hon. Dr. John Rolph was a contemporary, being born and having practised in the neighbouring village of Thornbury.

Parry had the good fortune of having lived during one of those periods when great events stimulate men to intellectual activity and action. When a child of eight, Britain was celebrating the conquest of Canada and the end of the Seven Years' War (1763); the American Revolution was midway in its course when he married and settled at Bath. A year after the downfall of Napoleon, he had an attack of hemiplegia with aphasia, retired to his farm near the town and died six years later. The national awakening of the days in which he lived is recalled by a few of the great names of the period—Pitt, father and son; Burke and Fox; Nelson and Wellington; Hume and Johnson; Goldsmith and Burns; Reynolds and Gainsborough; Garrick and Siddons; Hunter and Jenner; Herschell and Hales; the Wesleys; Franklin and Washington. In this period the first medical schools were established in America; 10,000 United Empire Loyalists settled in Upper Canada; the industrial revolution was transforming the lives of the British people.

While at school in his native town, Parry met Edward Jenner with whom he formed an intimate friendship, which continued for the rest of their lives.

He began to study medicine in Edinburgh in 1773, when William Cullen in Medicine, Alexander Monro, (Secundus) in Anatomy, Joseph Black in Chemistry, William Gregory and others, were making the Scottish capital the popular medical centre of Europe. After two years, following a good custom to broaden undergraduate experience, he transferred to London where he lived with Dr. Thomas Denman—famous in his day as physician-accoucheur to the Middlesex Hospital. In 1777 he returned to Edinburgh to complete his course, graduating M.D. a year later with an inaugural dissertation of 102 pages, "De Rabie Contagiosa." Hydrophobia was a subject of much medical interest in those days, John Hunter, who advised excision of the wound as the only cure, Alexander Monro (primus), Haygarth, Fothergill and others contributing to its discussion.

Young Parry's popularity with his fellow students in Edinburgh is shown by his election as president of the Medical Society, a student organization for which he was instrumental in obtaining a Royal Charter, which remains a unique distinction even to the present day for an undergraduate organization.

The year of his graduation he married a beautiful Manchester lady, Miss Rigby, and after a continental tour with his bride, during which they travelled in Holland, Flanders and France, they settled in Bath in November, 1779. His son, Dr. Charles Henry Parry, (1779–1860) states that during his entire professional career his father scarcely left the town even for a day.

Authentic history records the establishment by the Romans under the Emperor Claudius about 45 A.D. of a health resort at Aqua Sulis as they named the place, and the building of extensive baths. Bath had a varied career during the succeeding centuries but it was always a place of interest, attracting people of note. The town's fortunes experienced a great revival at the beginning of the eighteenth century under Beau Nash—adventurer and gambler who later turned his attention to organization and reform. How this uneducated, somewhat vulgar, swaggering autocrat, who, to win a bet, was said to have ridden naked through the streets of his native town of Swansea on the back of a cow, became acknowledged "King of Bath"; how he brought order out of chaos and made the town a social centre of England, whence everyone of note repaired to take the cure and enjoy the fun, is one of those romances in real life where truth is stranger than fiction.

Bath was at the height of its glory before Parry was born and maintained its social prominence until the end of the century. It was not a place in which a man of Parry's type easily established himself in practice and his early disappointments required the encouragement of his friend, Dr. Denman. There is no doubt some truth in Johnson's observation—"a physician in a great city seems to be the mere plaything of fortune; his degree of reputation is for the most part casual; they that employ him know not his excellence; they that reject him know not his deficiencies." Denman's counsel was more to

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the point—"on the whole I do not know what any man can do to get patients, but to qualify himself for the business."

Dr. Tobias Smollet, better known as novelist than physician, has left a description of Bath, its society and customs in "The Expedition of Humphrey Clinker" and "Peregrine Pickle," which is not alluring but no doubt is coloured by his own misfortunes. A disillusioned, cynical, emaciated, asthmatic, in 1771, the year of his death, Smollett offered his body to John Hunter for dissection. A peculiar taste of the Bath waters, which he disliked, Smollett eventually accounted for to his satisfaction—in their course to the surface they passed through an old Roman graveyard.

He practised there about 1746 but soon gave up in disgust and devoted himself thereafter to literature, but unfortunately without financial success, as shown by his having to appeal to his fellow Scotsman, William Hunter, to come to his assistance. The latter obliged him by a loan of £50. One of his characters in "Humphrey Clinker," Lydia Melford, describes a morning scene at the baths: "At eight we go in *déshabillé* to the pump-room, which is crowded like a Welsh fair; and there you see the highest quality and the lowest tradesfolk, jostling each other without ceremony, hail fellow, well met. The noise of the music playing in the gallery, the heat and flavour of such a crowd and the hum and buzz of their conversation gave me the headache and vertigo."

The doctors of Bath, according to Smollett, were the secret agents of scandal, ravens hovering over a carcass, with correspondents in London who inquired into the history, character and distemper of everyone who went for the cure.

At this period William Fielding was a resident, and Squire Allworthy, the hero of "Tom Jones" was Ralph Allen of Prior Park, who laboured so faithfully with Beau Nash and the architects, Wood—father and son, in transforming the place into a well-ordered and model city.

If a doctor's income is any criterion of success, Bath was not such a bad place for practice, for in ten years Parry was making from £300 to £600 a month. He was an indefatigable reader, a careful observer, and like Heberden, John Hunter and others of his time, made accurate notes of his observations.

"The great book of nature, which is alike open to all and is incapable of deceiving, I have hourly read, and I trust not in vain. During the first twelve or fourteen years of my professional life, I recorded almost every case which occurred to me either in private practice or in the conduct of an extensive charity. . . . This I have generally done on the spot or rarely deferred beyond the day of observation, always rejecting what, on repeated and varied inquiry, I have not been able fully to verify."

It is stated that John Hunter was under his care in Bath during his illness in 1776, and a biographer of Edward Jenner, states that Jenner suffered from an attack of typhus fever in 1794, and "the excellent Dr. Parry of Bath came to attend him." No doubt the sick of diverse diseases who sought relief in the healing waters of Bath, provided Parry with unusual material for observation. Dissatisfied with many of the principles that regulated the practice of medicine of his day, he projected the publication of a system of pathology and therapeutics, which, however, he had not time to complete. Much of his best work was rescued from oblivion by the devotion of his son Dr. Charles Henry Parry in undertaking "The collection of his unpublished writings" which were printed in 1825.

Undoubtedly Parry's most important contribution to medicine is contained in his report of eight cases of "Enlargement of the thyroid gland in connection with enlargement and palpitation of the heart," which appeared among his "Unpublished Writings." His first case was recorded in 1786 but it was not until 1813 when he had three cases under observation at one time, that the idea occurred to him of a connection between the malady of the heart and the bronchocele. In his recognition of this disease, therefore, Parry anticipated all other observers whose names have been associated with it—Flajani (1800)—Graves of Dublin (1835) and Basedow (1840). Parry also described facial hemitrophy in 1814, being the first to recognize the condition. A description of "a case of congenital *idiopathic dilatation of the colon* in an adult male with digestive disturbance," appeared in the "Collection of his unpublished writings." This condition was subsequently lost sight of until it was made the subject of a paper by Hirschsprung at the Berlin Medical Congress in 1886, by whose name it is now usually designated.

His experimental work and observations on the arterial pulse, his paper on the "utility of venesection in purpura," etc., are of no great interest at the present time. In 1799 Parry published a paper on "the symptoms and causes of syncope anginosa, commonly called angina pectoris, illustrated by dissections "From the time of John Hunter, this disease has always had a peculiar interest to physicians and has not inaptly been called "the doctor's disease." The first reference to angina pectoris is said to have been by Seneca; Morgagni refers to "a certain divine who used to point to the sternum as the seat of his pain, this symptom proceeded from a disease in the great aorta." To William Heberden of London (1710–1801) whom Johnson called, "Ultimus Romanorum," however, is due the credit for the first accurate description of the malady, in a paper read at the College of Physicians, July 21, 1768. For conciseness, clearness and accuracy Heberden's paper is a model which subsequent writers have never excelled. A second paper by Heberden was read in 1772, based upon fifty cases he had seen up to that time. Shortly after this, Heberden received a letter from a patient with angina pectoris, giving an excellent description of his symptoms and

offering his body for dissection in the event of his anticipated sudden death. This patient died suddenly less than three weeks afterwards and John Hunter made an autopsy. No manifest cause was discovered, but Jenner, who probably was present, says "he was almost sure the coronary arteries were not examined."

In 1722 Dr. John Wall of Worcester wrote a letter to Heberden describing his observations in twelve or thirteen cases he had seen, of whom all but three died suddenly; he then described a patient age sixty-six, afflicted six or seven years, who had several attacks of rheumatism . . . could not go up-stairs, nor lie down, nor get out of his bed without bringing on violent dyspnœa, etc."; he had cough and expectoration towards the end; pulse small and regular, hardly perceptible during attack; at autopsy they found fat about the heart; fluid in the thorax; heart of uncommon size; pericardium contained not less than a pint of fluid; aortic semilunar valves found to be perfectly ossified; aorta at its curvature enlarged and for nearly an inch from the heart in part ossified. Wall concluded that the "origin of this disorder is evidently to be traced to induration of the semilunar valves, etc." This case was obviously not angina pectoris, but heart disease due to rheumatism. The association of endocarditis with rheumatism was observed by Jenner but not published. Matthew Baillie shortly afterwards published the first description of rheumatic endocarditis (1786).

Dr. William Haygarth of Chester, afterwards of Bath, reported a case of angina pectoris in November, 1773, but "his patient spat up purulent fluid, had a rapid pulse, fever, sweats, pain with unremitting violence" and he was convinced the pain was occasioned or accompanied by an inflammation of the mediastinum." A mediastinal abscess was found at autopsy, and Haygarth suggested operation as a possible means of cure. This is another example of mistaken diagnosis, evidently due to the fact that the symptomatology so fully described by Heberden was not yet clearly appreciated by the profession.

In 1774 and 1775 Fothergill describes two cases of angina pectoris with typical symptoms, on which autopsies were made; the first autopsy was inconclusive; the second, performed by John Hunter, revealed evidence of ossification of the structures of the heart; the substance of the ventricles was pale, ligamentous and in parts whitish and hard, the mitral valves stiffened; there was ossification in the wall of the aorta and "the two coronary arteries from their origin to many of their ramifications upon the heart, were become one piece of bone." This case is important because it is the earliest record of disease of the coronary arteries in angina pectoris. In Fothergill's papers his ingenuity and resourcefulness in treatment are in striking contrast to the measures recommended by Heberden and the treatment carried out in John Hunter's case by himself, Matthew Baillie, David Pitcairn, Everard Home and other attendants.

Parry, Jenner, Hicks of Bristol, Ludlow of Corsham, Matthews of Hereford and Mr. Paytherus, belonged to a small medical society—the "Medico-Convivial" which usually met at the Fleece Inn at Rodborough; after dinner there were papers and discussions. In 1776 Jenner read a paper on angina pectoris and reached the conclusion that it was due to disease of the coronary arteries, but not wishing to alarm his friend, John Hunter, who then had anginal symptoms, he did not publish his observations.

He wrote to Heberden, however, that he would be exceedingly thankful for his advice upon the subject. For some reason this letter never was forwarded. He states that he had seen John Hunter in Bath the previous autumn and that he thought that he was affected with symptoms of angina pectoris, and though in the course of his practice he had seen many fall victims to this dreadful disease, he had only had the opportunity of seeing two post mortem examinations. In one of these there was no material disease of the heart, except that the coronary artery seemed thickened. About three weeks before, Mr. Paytherus desired him to examine with him the heart of a person dead of angina pectoris and they found the same appearance of the coronary arteries as in the former case. What Jenner had taken to be ossification of the vessel itself, Mr. Paytherus had discovered to be a kind of firm, fleshy tube, formed within the vessel, but having no vascular connection with the coats of the artery." Jenner was apparently unaware that John Hunter in Fothergill's case had found coronary artery disease at an autopsy in 1775. Parry did not add anything to our knowledge of angina pectoris; apparently Jenner's paper was the ground-work of his contribution, but this he evidently had forgotten.

Although they were close personal friends and at times collaborators, it is astonishing that neither Hunter or Parry apparently interested themselves in Jenner's epoch-making researches on cowpox and vaccination. Parry's interests and activities, like those of John Hunter, Jenner, Fothergill, extended beyond his own profession to other domains of natural science, and he became a recognized authority on agriculture, and especially on the breeding of sheep and the growing of wool. In 1786, he acquired a farm in the neighbourhood of Bath within a walk of his town residence and between that time and 1814, published eighteen papers in "The Proceedings of the Bath and West England Agricultural Society" and "The Farmers' Journal." He was interested especially in the breeding of merino and other fine-wooled sheep, and from "the frequent competitions in which he was engaged with the breeders and manufacturers of the finest home and foreign wools and cloths and from the various prizes which during many successive years, were awarded to his exhibitions," it is evident that he was very successful in this diversion. A patriotic sentiment evidently prompt-

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ed these activities in stimulating home industry and providing employment by capturing an industry heretofore belonging to Spain and France.

Parry died in 1822, respected as a high-minded, scholarly, observant, nature-loving physician, who had found time in the exacting routine of a successful general practice, to make valuable contributions to medical knowledge. He was a representative of the new school of medical observers, to whom Hunter's advice to Jenner, "don't think, try the experiment," had become a guiding principle.

The contrast between medical practice in Parry's time and that immediately preceding, is well exemplified in the life of another old Bath physician, George Cheyne (1671–1743).

During the first half of the eighteenth century, medicine was still struggling under the blighting influence of the iatro-mechanical or mathematical school founded on the teaching of Borelli of Pisa (1608–1679), continued by Boerhave of Leyden (1668–1738) and his pupil Archibald Pitcairn of Edinburgh (1652–1713). There had been occasional signs of revolt against the mechanistic theories of this school insomuch that the eccentric, pugilistic, famous Aberdonian, George Cheyne, who settled in Bath about the beginning of the eighteenth century, entered the lists in behalf of his preceptor and friend Archibald Pitcairn, who "had been assaulted by two bloody minded beasts of prey" in the persons of Dr. Andrew Brown and Dr. C. O. Oliphant. Cheyne was a noted mathematician, originally like Pitcairn, intended for the church, but both became free thinkers, though Cheyne afterwards recanted.

He was a prolific writer, a keen conversationalist, whose free living in his early days accentuated a family tendency to obesity, until he attained the huge weight of 446 pounds. He went on a diet of milk and vegetables, recovered a fair measure of health, and thereafter preached temperance in an age of hard drinking and gluttony. Among his patients were David Hume, Pope and Samuel Richardson. Johnson recommended his books to Boswell, "I would not have you read anything of Cheyne but his 'Book on Health' and his 'English Malady' "; John Wesley said of one of his books—"it was one of the most ingenious books which I ever saw." Cheyne naturally was ridiculed by some of his contemporaries, Dr. Wynter breaking out in the following lampoon:—

Tell me from whom fat headed Scot
Thou did'st thy system learn?
From Hippocrates thou hast it not
Nor Celsus or Pitcairn.

Suppose we own that milk is good,
And say the same of grass,
The one for babes is only good,
The other for an ass.

Doctor, one new prescription try,
(A friend's advice forgive),
Eat grass, reduce thyself and die,
Thy patients then may live.

Cheyne's reply shows he was able to look after himself:—

My system, doctor, is my own;
No tutor, I pretend,
My blunders hurt myself alone,
But yours, your dearest friend.

Were you to milk and straw confined,
Thrice happy might you be;
Perhaps you might regain your mind
And from your wit get free.

I cannot your prescription try,
But heartily forgive,
'Tis natural you should bid me die,
That you yourself may live.

Yet with all his eccentricities Cheyne mixed a good deal of sound common sense—"Every man past forty is either a fool or a physician."—"Nothing conduces more to health and long life than abstinence and plain food with due labour."—"Too great a nicety, and exactness about every minute circumstance that may impair our health is such a yoke and slavery as no man of a generous and free spirit would submit to."—"'Tis to die for fear of dying."—"Fine folks use their physicians as they do their laundresses, send their linen to them to be cleaned in order only to be dirtied again."—"Every wise man after fifty ought to begin to lessen at least the quantity of his ailment abating gradually and sensibly, and at last descend out of life, as he ascended into it, even unto the child's diet."

No doubt Cheyne was a representative in those days of that hardy perennial, "the physician of the old school," whose early disappearance was being heralded and lamented, but medical practice was undoubtedly benefitted by the exchange of doctors of his type for such as the Hunters, Heberden, Jenner, Parry, Cullen, Baillie, Withering and John Fothergill. In their thoughts and methods, the latter are essentially modern, and no deep gulf separates them from clinicians of the present day.

Legislation re Bovine Tuberculosis.—William G. Savage criticizes recent British legislation relative to the control of bovine tuberculosis, in the September, 1926, number of the *Journal of State Medicine*. An analysis of the records of Somerset leads him to believe that the disease is usually far advanced before it is detected and consequently slaughter comes too late to prevent much mischief. He thinks that the preventive outlook is not sufficiently considered in the administration of this legislation, and that until this phase receives adequate attention there will be little accomplished in reducing the dangers of tuberculous milk or even in diminishing the incidence of bovine tuberculosis.—W. H. H.

Report of Societies

CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS, MONTREAL, OCT. 25th to 29th, 1926

The Aims and Philosophy of the Congress

The Clinical Congress is but one of the many activities of the College. During these days the College comes out in the open to render to the profession and the public an account of its stewardship. They are testing days; for the work of an organization is likely to be judged on the evidence of its major function, and admittedly, the Clinical Congress is the biggest thing of its kind in the whole range of our profession. An occasion which brings together, from practically all the leading nations of the earth, an assemblage of surgeons which runs up to three and four thousand, must have a sound basic philosophy, an abiding sincerity, a practical outlook, and withal, an ever increasing attraction for them that seek a yearly focus of the world's advances in all that pertains to the healing art.

Clinical parentage brought the American College of Surgeons into existence. To hold one big yearly congress, and numerous sectional ones, whereat doctors could see each other in action, was an early conception of the College. To bring the small surgeon from his remoteness to the large centre to watch the big fellow operate and perform his whole surgical routine, has worked out well in the College's practice, and has amply justified one of the purposes of its founders. It has taught the small surgeon many things. Amongst them, the fact that some of the best workers in the science and craft of surgery, are not necessarily found in the guild of surgical writers. The silent worker thus finds his place as a moulder of surgical thought and practice. It has been teaching the small surgeon, too, that all things surgical are not written in books and pamphlets, and that actual contact with the man and his work may not be ignored. Even a great surgeon cannot put himself entirely into his book. His individuality, and perhaps his eccentricities, bear closely on his thought and action, and they can only be well interpreted by actual contact. The clinical congress, then, seems to be fulfilling a useful purpose. Its popularity is beyond question, and only rigorous limitation can keep the attending assemblage down to a manageable point.

There were periods in the long history of surgery in which the craftsman's part of the work was disdained as menial and humiliating. It was this absurd divorcing of brain and hand that produced the barber surgeons, the travelling mountebanks, and other types of fakirs. It brought surgery into disrepute, and subjected it to such taunts as only comparatively recent times have wiped out. The educational value of any great conference of surgeons to-day, is incomplete without an exhibit of all the mechanical devices that aid the surgeon in becoming an expert craftsman. Mechanical science, electricity, etc., are to-day the handmaids of surgery. Every year brings inventions and improvements in some way or other, and there was much to be learned during the congress in roaming among the countless displays of instruments and supplies at the Windsor Hotel.

A prefatory word on the aims and philosophy of the College of Surgeons. incomplete as it is bound to be, would be inexcusable without a reference to the spirit of internationalism which pervaded its whole structure. It is a fine thought this, and one is glad to find it in practice where its reality cannot be called in question. Medical science knows, of course, no national boundaries, and the discovery of to-day goes at once into the hands of the whole profession, and becomes the property and pride of all the world. The clinical congress brings together men from the new and the old countries. They bring the ripened experience of their own clinics, the best in the land they represent. They come to instruct, and to be instructed, and in this delightful interchange of scientific knowledge is evolved a real and abiding fellowship, a rational world league, which not only holds on high the torch of surgical science, but makes for amity and peace and progress between nations and races. The Great Mace, the gift to the college of the consulting surgeons of the British armies, symbolizes, among other things, a harmony of effort and unity of purpose between English speaking peoples in the things that strike deepest into the welfare and happiness of mankind. If the "Parliament of Man, the Federation of the World" ever reaches maturity, a great force in its evolution will be found to be this and similar organizations, where thought is unhampered by party politics, by national boundary lines and the lust of empire; where there is one call and one goal and that to conquer disease, and thus promote the universal interest of the race.

The Clinical Congress in Action

Hospital standardization.—The hospital standardization section, opened the first meeting of the congress in the Windsor Hall, on Monday, Dr. Rudolph Matas, of New Orleans, presiding.

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These meetings continued throughout the week with vigor and interest, and showed clearly the vital hold this great work of standardization has on the whole scope of surgery and medicine. A general review of the week's discussions and papers in this section of the congress leaves one with a very definite conviction that, if the College of Surgeons never did more than create a minimum standard, make it a workable entity, and enroll by the most careful personal inspection the hospitals of this continent, and, in fact, other continents, within its requirements, it would merit the gratitude of our profession and the public. One watched with interest the reactions of distinguished surgeons from countries where hospital standardization does not obtain. To them much of this activity is new, and a strong, traditional conservativeness is not so easily set aside. There were none, however, of the guests who did not speak words of praise for the great things accomplished in organizing the hospitals, words of regret that their own hospitals were not yet on this progressive march, and words of hope that, ere long, this movement would reach around the world.

Professor P. D. Wilkie, of Edinburgh, in speaking of the hospital problem in his own country, said, "I firmly believe that hospital standardization is the very best thing in the medical profession in this century. It is a great demonstration of the practical idealism of the people of the American Continent." He believed that Old Country hospital methods were not well balanced in their bearing upon different classes, and could not go on. The remedy, he thought, was standardization, staff meetings, and the other requirements of the minimum standard. "If Sir William Osler were here to-day," he said, "he would rejoice at the progress you have made."

Our Antipodean brethren were heard on hospital standardization in the person of Dr. L. E. Barnett, Professor of Surgery at Otago University, New Zealand. He told the assembled surgeons and hospital officials present, many things about their efforts to improve the various services of their hospitals. During the last year, on invitation of their government, Dr. M. T. McEachern came to New Zealand, inspected their hospitals, and explained the doctrine of the minimum standard to legislators, hospital officials and doctors. The results, he said, were most satisfactory, and as a result of Dr. McEachern's work he hoped to see, not only New Zealand, but all the British Dominions, standing together for higher efficiency in hospital service. Dr. McEachern's mission covered Australia as well, and his work there was commended highly by several speakers, notably Dr. Rudolph Matas, the retiring president of the College, and Dr. Franklin Martin.

Other speakers on standardization were Dr. D. Sclater Lewis, representing the American College of Physicians, and Dr. Edward A. Fitzpatrick, Dean of Marquette University Medical School.

Dr. Franklin Martin, Director-General of the College, presented his report on hospitals for the year. This report has been published, and is available for all who wish to see for themselves the fruit of standardization. There is no doubt expressed in the intensely zealous and able mind of the Director-General, as to what the American College of Surgeons has done for the hospitals. "All the world," he said, "is watching this movement. They are forgetting their traditions, and are looking to this as the greatest advance movement ever started for improving the care and treatment of the sick."

An interesting feature of Monday's meeting in the Windsor Hall, was an address by Sir Arthur Currie. He linked up medicine and higher education, and told the place McGill had always taken in medical education. The first degree ever given by McGill was a medical degree. He quoted Disraeli to show the principal concern of the State was the health of the people.

Sir Lomer Gouin spoke for the University of Montreal, and like Sir Arthur, extended a cordial welcome to the visiting surgeons.

The Education of the Nurse.—During most of Monday afternoon the nursing profession was viewed and discussed from many angles, until there seemed to be little more to say. The whole discussion postulated that the nurse had become an essential force in everything that makes for the welfare of the sick, and as such, has to be reckoned with in her education, and in every one of her numerous points of contact with the medical profession. Some of the papers carried the suggestion that the nursing profession was tending to get off on a tangent of its own, of evolving a sort of glorified product that would be a little more than nurse and a little less than doctor. This would not make for the good of either; would mean a loss of perspective in the fundamental aims of nursing, and a disjointing of that whole system which, as a composite entity, comprises every agency entering into the treatment of the sick. The logic of it all is, that the medical profession, as the major body, must keep the education of the nurse well in hand, so that her training be designed primarily to her supreme object—*that of nursing sick people.* Many of the speakers emphasized the importance of practical training over the strictly scientific side, notably, Dr. A. T. Bazin, of Montreal, who has of late been giving considerable thought to the subject. To be able to go into the kitchen, and, with all the fine touches of the culinary art, create an appetizing dish for her patient, was in the opinion of most

of the speakers, a much greater asset than a knowledge of the distribution of the fifth nerve, or the functions of the pituitary body.

Dr. L. J. Austin's somewhat humorous sketch of the dominating head nurse, of the nursing homes in the Old Country, reminded one of Dickens. We have no such personage in this country, and we are not going to have.

The question of specialization received some attention. It was claimed that a system of specialization might tend to weaken the nursing system of the hospital, while opposing opinions favoured it on the grounds of more expert service, instancing the operating room as a department where special selection and training should obtain.

Interesting and exhaustive papers were read by the heads of nursing schools and nurses' associations in Canada and the United States. These ladies supplied an enormous amount of information on many phases of the nursing proposition.

General Conference.—The Windsor Hall programme, on Tuesday, was unique in some respects. For perhaps the first time in history, doctors, hospital officials, nurses, representatives of big industries and insurance officers sat down together to try to understand each other, and work out an equitable *modus operandi.* One heard, on this occasion, much about industrial patients, industrial surgery, etc. In fact, it is quite certain that industrial surgery is assuming all the earmarks of a specialty. The relations between the workman's compensation boards and the hospitals was discussed at considerable length, it being suggested that the ordinary minimum standard did not meet all the requirements for treating every type of accident, and that certain special standards should be set for hospitals in care of the industrially injured. Dr. Fred H. Albee, of New York, was among those who discussed "Special features in hospitals for industrial patients." Charles Deckelman, Hartford, Travellers' Insurance Company, and W. G. Philips, Baltimore, United States Fidelity and Guaranty Company, were two of the experts who endeavoured to link up the business interests of their companies with the various medical and surgical services rendered to their clients. The symposia and the individual papers abounded with interest, and should produce important practical results.

The clinics.—Montreal is one of the four cities of this continent with enough clinical resources to meet the needs of the congress. Detroit will likely be added to the list, for it is proposed that the congress meet there next year. It is an enormous undertaking to organize hospital clinics to meet the requirements of so large a gathering, and it was never done better than on this occasion in Montreal. A tribute, therefore, is due to the able committee for a difficult task splendidly performed. The non-operative (dry) clinics are becoming more popular and they were particularly emphasized at this meeting. And rightly so; for operation demonstrations are satisfactory only for the comparatively few that can see the work at close range. The admission to the clinics was the same as on previous years, and one made one's own selection. All the leading general surgeons and specialists in the city were at work in their operating theatres during the forenoon, and the afternoon and evening were given over to other things, principally papers and addresses and clinics. The operations covered practically the whole field of general and special surgery, and the man "out for operations" had a real, good time.

One has learned to look at this meeting for the world's yearly focus of advances in our science and art. Cancer is the hardy annual which is up every year, and every year promises a reappearance. It has been pulled up by the roots, held before one congress after another, and learnedly discussed in all its parts; its predilections for different kinds of soil, its mode of appearance at different times and places, its normalities and eccentricities; in fact, a full description of the thing; so that one has come to recognize the old weed pretty well; but we are just where we always were with regard to the fundamental urge or force which brings the first cancer cell into being, and starts it on a career of independent growth to the detriment and even destruction of its host. Two learned papers on the subject were presented by Dr. W. W. Chipman, of Montreal, and Dr. W. J. Mayo. Perhaps a broad inference from the papers would be an increasing scepticism for the germ theory of cancer. Nothing new in the way of treatment was brought forward except some improvement in the technique of the old agents, the scalpel, radium, x-ray diathermy and cautery. Early recognition is essential in all cases. W. Sampson Handley, F.R.C.S. of London, England, made a strong plea for the use of radium in breast amputations. The radium to be placed within range of the mediastinal lymph nodes behind the sternum, near the neck, and axilla. Reports on cervix cancers show that little good is coming from most hysterectomies. The advanced cases, undoubtedly, do better with radium treatment. Quite clearly, the indication is, by shifting from one to the other, to make the most of our present facilities for treatment; educate the public carefully in the way of early recognition, as urged by Dr. Chipman, and hope and work for better things.

Fracture Symposium. — Since Hippocrates, fractures have occupied a big place in surgery, and there seems little likelihood of their losing their status in the deliberations of the modern

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surgical congress. The symposium in the Windsor Hall, on Friday, was a great effort to work out ways of improvement in the treatment of different types of fractures. The Chairman, Dr. Charles L. Scudder, presented an array of speakers from the United States, Canada, and Great Britain, every one of whom spoke from a wide experience, and intensive study of his subject. The medical schools cannot emphasize too much the importance of the proper treatment of fractures. In fractures of the long bones, particularly, the lack of adequate equipment in the smaller hospitals is often responsible for unsatisfactory results. This was emphasized in Dr. Scudder's report to the Board of Regents, as head of the Committee on Fractures. Over two hundred thousand fractures occur in the United States and Canada every year. Every practitioner should provide himself with, at least, the essential equipment. A good supply of Thomas' splints will go far to meet the requirements. "Fractures should be set, if at all possible, before swelling takes place," said Dr. Joseph Blake, of New York, "Circular bandaging and plaster of paris is not so good as the Thomas' splint." Open treatment of fractures and plating should be done only when conservative means have failed in reduction and immobilization. The fracture ward at the Montreal General, with the demonstrations there under the direction of Dr. Frederick J. Tees and his assistants, was one of the most useful features of the congress.

The Motion Picture in Teaching of Surgery.—Mr. Will Hays, of New York, President of the Motion Pictures of America, and one time Postmaster-General of the United States, appeared before the Board of Regents of the College, and offered the resources of his great company to film operations, or any work the college could use for teaching surgery, and medicine and public health. The control of all such pictures should rest with the college. A large committee is being formed to deal with the matter. There are great possibilities here; and in getting the co-operation and interest of such a man as Mr. Will Hays, it is a fair guess that the genius and enthusiasm of the Associate Director, Dr. Alan Craig, has had much to do with it.

Addresses, Personals, Convocation, etc.—Three addresses which stand apart from the routine of things in the congress, are the President's address, the Fellowship address, and the John B. Murphy Memorial Oration. They are picked men who assume these functions; and they are not necessarily confined to the surgical craft either, Lord Dawson, the distinguished English physician having delivered the Fellowship address last year, in Philadelphia. Much licence in the field of thought is allowed the speakers. They may reach out into the philosophy of our ancient calling, or to the lives of the illustrious departed in order to gather material to weave into, and brighten the background in the picture of the practical and strenuous life of the surgeon. Many will recall Sir Berkeley Moynihan's memorial address delivered at the congress in Montreal, six years ago. Easily a classic, it is a lasting contribution to this type of medical literature.

The high standing of this function was well maintained this year. Dr. Walter W. Chipman took for his presidential address, the most inspiring thême in the long history of surgery, and the effort was worthy of his high reputation as a surgeon, writer and speaker. One almost envied him the unique fitness of his subject. Here was the closing of a week, during which surgeons from many parts of the world met and told about their surgical triumphs; and here, behind it all, was the life and work of the master surgeon, Lord Lister, who made these things possible —the man who Sir Berkeley Moynihan said had saved more lives than all the wars of all the ages had thrown away.

Professor Archibald Young, of Glasgow University, Scotland, delivered the John B. Murphy memorial oration. Professor Young succeeded Sir William Macewen in the chair of surgery at Glasgow, and thus holds the distinction of being the third in succession to the immortal Lister. One would judge, however, that the trappings of environment, or the renown of the position he holds, would touch but lightly this serene, thoughtful and modest looking man. The man and his work, rather than the mantle he wears—beautiful and historic as it may be—counts with Professor Young. His address was a thoughtful, sympathetic analysis of the life and work of Sir William Macewen. No one could speak with more authority, for Macewen was his teacher and chief for a number of years. He found many likenesses between him and the great Chicago surgeon. They were both men of enormous mental power and initiative, to whom the beaten paths of science offered opportunities for improvement, and the founding of newer and better routes. They both had the original outlook. Zealous, painstaking, hard working, chafing impatiently under anything and everything that interrupted his working routine, and strong in his convictions, one might suppose it could be said of him what some one said of Murphy, "that he was respected rather than loved." His notable additions to our knowledge of brain surgery were emphasized by the speaker, as well, too, as Murphy's great pioneer work in the abdomen. Referring to Sir Berkeley Moynihan's "great procession" of the immortals in medicine and surgery, he could easily find a place for Sir William Macewen.

The high intellectual standard, which able men in previous years had given to the Fellowship address, was well maintained by Sir Ewen

J. McLean, F.R.C.P. (Lond.), F.R.S., (Edin.), Cardiff, Wales. Sir Ewen developed his theme largely from the Fellowship pledge of the College of Surgeons. The address filled in well between the lines of the Pledge, and brought home to the newly elected Fellows, the high ideals and obligations of the surgeon.

Of the foreign guests at the congress, a striking figure was Professor Roberto Alessandri, of Rome, Italy. He is a great surgeon in his own land; and, at the evening meeting on Tuesday, he told in a learned address, (in English) what he knew of "Tumours in bones of thyroid and parathyroid type." The lay press found distinction for him in the fact that he is surgeon to Mussolini. Tall and firmly knit, almost stern in countenance, he looks as if he might have in him some of the mettle of the great Italian political reformer.

The highest official honour in the gift of the college went to Dr. George David Stewart, of New York. He will worthily fill the President's chair, and his appointment is highly popular. Born in Malagash, Nova Scotia, he says himself that the principal diet of his boyhood was "porridge and the shorter catechism." He grew big on it, at any rate, physically and mentally, and his standing as a surgeon is continental. He has a fine literary taste as well, and a bump of Scotch humour which must be almost as big as his heart. The writer extends congratulations.

GEORGE H. MURPHY, M.D.

Halifax, N.S.

VALLEY BRANCH, MEDICAL SOCIETY OF NOVA SCOTIA

The semi- annual meeting, held at Berwick on the twelfth of October under the presidency of Dr. William Grant of Wolfville, was very well attended and proved most interesting. Appropriate references were made to the loss sustained in the death of Dr. Augustus Robinson, of Annapolis Royal. Dr. McGrath, Kentville, reported a case of infantile paralysis in a lad of fourteen, which presented some unusual symptoms especially in respect of late onset of the paralysis. A very interesting discussion followed, led by Dr. Elliot, Wolfville. Two chronic cases of disease of the nervous system were shown; one of spastic paralysis and one showing marked atrophy of the infraspinatus. Drs. Burns of Kentville, DeWitt of Wolfville and Morse of Lawrencetown, described interesting cases in their practices, and Dr. Murphy of Halifax, related his experience in a rather extensive epidemic of infantile paralysis in Cape Breton in 1908.

Dr. Morse demonstrated a case of hydrocephalus, and Dr. Bezanson of Aylesford a case of actinomycosis. Dr. Murphy, who had seen the latter case, described the treatment by operation, cauterization and potassium iodide; a treatment which had effected a very satisfactory cure.

Dr. Sponagle, Middleton, reported two interesting cases; one of appendectomy and one of pregnancy complicated with an intraperitoneal tumour. Dr. Killam, Lakeville, reported a fatal case of acute malignant pemphigus, which elicited a very instructive discussion.

Dr. Murphy, Halifax, was then called upon for the principal paper. He discussed fractures in and about the hip, demonstrating the points in diagnosis and treatment by the use of films, and a living subject. He explained the reasons for the positions assumed by the leg after various fractures and the methods used in securing apposition, and emphasized the importance of getting the nearest possible approach to perfect apposition. The value of the Whitman plaster was fully discussed, and the need for prolonged disuse of the injured limb was stressed. Dr. Murphy's address provoked an unusually helpful discussion.

In the evening the members were entertained at dinner at the Western Kings Memorial Hospital, when Mayor Chute extended an official welcome and speeches by several members added to the pleasure of the occasion.

Dr. MacIntosh, Halifax, was a guest at the meeting. Dr. Forbes of Kentville and Dr. Davis of Berwick were elected to membership.

C. E. A. DEWITT

EASTERN COUNTIES BRANCH, MEDICAL SOCIETY OF NOVA SCOTIA

The annual meeting of the Eastern Counties Branch of the Medical Society of Nova Scotia was held at the St. Martha's Hospital, Antigonish, on September 21st. The president, Dr. J. L. McIsaac, was in the chair. There was an excellent attendance of members and several guests, including Dr. J. J. Roy, of Sydney, the president of the provincial society. After the disposal of routine business, Dr. G. H. Murphy, Halifax, addressed the Society on fractures of the neck of the femur. To-day, as in the time of Hippocrates, life, union and function are three things which must have consideration in any fracture. Fractures at the neck of the femur are usually both intra- and extra-capsular, and the familiar description of the two types is not fully justified. With much damage to the capsular ligament, which carries most of the blood supply to the head of the bone, good union is not to be expected. The artery which accompanies the ligamentum teres does not usually function in old age. In discussing the symptoms, attention was called to the frequency with which shortening is not to be noted until some hours

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have elapsed. In young people, an obturator dislocation may cause deformity very like that of fracture of the neck of the femur. In the treatment, await the subsidence of shock. Correct deformity, under anæsthesia, by Whitman's method. Extend, invert, abduct and flex slightly; put in plaster for three months. Get patient out of bed within a few weeks, if possible, but do not allow him to walk for a year. With proper treatment, operative interference is seldom necessary, but if there be no union at the end of a year, one is justified in interfering. The technique of operation in such cases was fully outlined.

Dr. S. R. Johnston, Halifax, followed with a paper on the diagnosis of gastro-intestinal diseases by means of the x-ray. In gastric and duodenal ulcers and gastric cancer the x-ray gives definite assistance in from 80 to 90 per cent of cases, the fluoroscope being of more value than plates. In gastric ulcer there are spasticity, local tenderness and retraction; spasm not due to a lesion is relaxed by belladonna. In duodenal ulcer, hypo-mobility and hypo-tonicity are useful signs. In scirrhus cancer of the stomach, shrinkage is usually marked; in other forms this is not the case. In early cancer of the œsophagus, the x-ray is not of much value, but any sign of stenosis in those of cancer age is suggestive. In chronic lesions of the appendix, the signs are lack of filling and slow emptying; segmentation is valueless, fixation is significant, kinking (if constant) is a valuable sign. Dr. Johnston's paper was illustrated by x-ray films.

Doctors G. E. Buckley of Guysboro, and D. M. Chisholm of Port Hood, greatly loved veterans of the profession, delighted the Society by recounting some of their earlier experiences in practice, and Dr. P. S. Cochrane of Inverness, reported an interesting case of hydatidiform mole, after which President McIsaac was host at a much enjoyed dinner.

In the evening, interesting cases were reported by Doctor Stone, Sherbrooke, and Dr. McGarry, of Margaree, presented a paper on the importance of careful observation and interpretation of symptoms. More routine business, including election of officers, was put through, and appropriate action was taken relative to the recent death of Dr. C. E. Aikins.

On the morning of the second day, after a tour of inspection of the new St. Martha's Hospital, an operative clinic was conducted by Doctors McIsaac and MacKinnon, each of whom performed a laparotomy. The anæsthetic used was ethylene.

The new officers are: Hon. President, Dr. J. E. Buckley, Guysboro; President, Dr. J. J. MacRitchie, Goldboro; Vice-Presidents, Doctors R. F. MacDonald, Antigonish, and M. E. McGarry, Margaree; Secretary-Treasurer, Dr. P. S. Campbell, Port Hood.

P. S. CAMPBELL

INTER-STATE POST-GRADUATE ASSEMBLY OF NORTH AMERICA

This Convention held at Cleveland, Oct. 18th to 22nd may almost be termed a "world meeting" for those who took part in the programme came from many lands. Great Britain, Norway, Sweden, Denmark, Germany, Holland, Hungary, Jugo-Slavia, Switzerland, Italy, France, Spain, Argentina, Brazil, Canada and all the large cities in the United States were represented. Visitors were most cordially welcomed, and their contributions were appreciated. The enrolled attendance was over 4000; to see this multitude for five consecutive mornings meet promptly at 7 a.m., and remain in session until 10 p.m. with short intermissions at 10 a.m. and 4 p.m. and from noon to 1 p.m. and from 6 p.m. to 7 p.m. for meals, was unique in medical congresses. Interest in medical papers begins to "ebb out" after the second day at most meetings, but at this one there was no evidence of any "falling off" in either attendance or in attention till its close at 6 p.m. on the 22nd. At the close a magnificent banquet was given on Friday evening.

This great meeting presented many interesting features. The mammoth Public Hall capable of seating 12,500 was almost bewildering to the visitor. The speaker on the platform seemed but "a mere speck of humanity" in the distance, but his voice when heard through the amplifiers, was loud and distinct. The programme included the whole field of medicine and surgery, and was limited to medical and surgical clinics in the morning followed by papers for the most part read in symposia. No time was allowed for discussion; and the programme was adhered to very absolutely by the chairman. The President-Elect was Dr. Larsen, of St. Paul, the Managing-Director was Dr. Peck, of Freeport. The programme Committee included Drs. Crile of Cleveland, Barker of Baltimore, Brewer of New York, Christian of Boston, Deaver of Philadelphia, Graham of Toronto, Herrick of Chicago and Meakins of Montreal.

All the clinicians, and very notable ones they were, emphasized the importance of a correct diagnosis. Scientific knowledge, experience, judgment, tact, patience, in brief all the scientific, intellectual, and moral attributes of the physician and surgeon should be concentrated on diagnosis in order to secure for the patient intelligent and efficient treatment. The great significance of the type of patient was vividly illustrated by "cases" exhibited on the platform to represent the neurotic, the "John Bull" and the lethargic types. Each type of patient should always demand attention, as each type had its own power of vulnerability and reaction. Slides and moving pictures gave valuable aid in making

clear to the audience the methods and views of the speakers. Special attention was given to the psychic attitude of the patient. The importance of the position of a patient when examining him was illustrated by a patient, male, who with his clothing removed to pubic line, stood erect and was viewed from every angle, inclined forward, backwards, and to either side, supine, prone, on knees and elbows for palpation of abdomen. We understand that the proceedings and all the papers, and clinics will soon appear in book-form.

JOHN HUNTER

HALIFAX BRANCH, MEDICAL SOCIETY OF NOVA SCOTIA

The opening meeting of the session took the form of a dinner meeting at the Halifax Golf and Country Club, Ashburn, held on October 13th. After a most enjoyable repast and the disposal of some routine matters, Dr. Weatherbe delivered his presidential address. In this he dealt more especially with the subject of medical education, with particular reference to the proposal that there should be, to quote from the report of the Committee on Education of the Canadian Medical Association, "a discriminatory registration of the consulting internist and of the consulting and operating surgeon." Dr. Weatherbe raised the question if such a procedure would secure the result desired, and suggested that what is really needed is such revision and improvement of the undergraduate curriculum as will ensure the making of general practitioners who are thoroughly competent diagnosticians. The most competent specialist must often fail if patients are not referred to him early enough. It is the general practitioner who sees patients when difficulties in diagnosis are most pronounced, and upon whom the responsibility lies of either directing treatment himself or of deciding when a case should be referred to one whose practice is specialized. Medical students should be impressed with the importance of being prepared to cope with any situation which may confront them, and of focussing upon problems with which they are sure to meet. If students can be made conscientiously appreciative of the responsibilities of medical practice, there need be no worry about the details of the curriculm. As Osler said: "As the practice of medicine is not a business and never can be one, the education of the heart—the moral side of man—must keep pace with the education of the head. Our fellow creatures cannot be dealt with as man deals with corn and coal."

Dr. Weatherbe's address was received with acclaim, and the thanks of the branch was moved in appropriate terms by Doctors Mathers and Walker. A unanimous wish was expressed that the full address should be published in the *Nova Scotia Medical Bulletin*.

A clinical meeting of the branch was held at the Nova Scotia Hospital on the evening of October 27th. Dr. Lawlor presented a patient in whom a large tumour, seemingly a lipoma, had developed on the right arm after a bite by a horse, and another patient who had sustained a fracture of the jaw as a result of an attempt at suicide by shooting. Several very interesting cases of mental disorder were demonstrated by Dr. Lawlor and Dr. Hopgood read a very interesting and comprehensive paper on mental hygiene, explaining the methods and objects of those engaged in that phase of preventive medicine. After discussion, the members were entertained very delightfully at supper by Dr. Lawlor, for which the thanks of the members were tendered him, upon motion of Doctors Morton and Corston.

VICTOR O. MADER

AMERICAN ASSOCIATION FOR THORACIC SURGERY

The American Association for Thoracic Surgery met on September 30th and October 1st and 2nd at the Ritz-Carlton Hotel, Montreal, under the presidency of Dr. Edward Archibald. This was the eighth annual meeting of this comparatively new society, and the first held in Canada. The president-elect for 1927 is Dr. Torek of New York.

The mapping of the bronchial tree, especially by the use of iodized oil, was the subject of a symposium. The great value of having such an opaque substance almost as easily available for the examination of the thorax as barium is for that of the intestine impressed all, but there was a difference of opinion as to how it should be used. Bronchoscopists and those who work in association with them inject iodized oil through the bronchoscope and consider this the only sure way. Besides which, as they point out, the bronchoscopic method is the only one by which information can be secured through direct vision concerning the appearance of the main bronchi, the site of origin of any pus, the stenosis of a bronchus or of any other pathological details. Others contended it could be given with almost, if not absolute safety through a needle by intra-tracheal injection, or by a special curved syringe through the glottis, or even by depositing it on the base of the pulled-out tongue. Nearly two thousand such injections without mishap were reported in favour of this method, and the needs of lung mapping, it was argued, were far beyond the availability of the bronchoscope. Dr. Gabriel Tucker of the Bronchoscopic Clinic, Philadelphia, showed the Jackson technique by a moving picture film, and Dr. David Ballon of

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Montreal presented a remarkable series of cases with very beautiful skiagrams.

One of the very valuable contributions was by Dr. David T. Smith of the New York State Tuberculosis Hospital at Raybrook. He reported an unusually careful bacteriological study of so-called septic non-tuberculous respiratory conditions, which showed a special spirochæte associated with a fusiform bacillus so uniformly that they can be considered as very probably the specific cause of many bronchiectases, lung abscesses and lung gangrene. These anærobic organisms commonly found in badly kept mouths are easily aspirated into bronchi, and this becomes especially easy when the defensive pharyngeal and cough reflexes are abolished by a general anæsthetic.

Such bacteriological studies give very definitely a new start in the consideration of the infections of lungs and bronchi. The presence of a spirochæte suggests neo-salvarsan, and success with this treatment has been reported by some observers. Willy Meyer stated that odour had disappeared following treatment by salvarsan in some cases. Others had found it disappointing though the organisms might disappear temporarily.

Chronic non-tuberculous lung inflammations were discussed in a symposium opened by Dr. W. F. Hamilton of Montreal. These had often been confused with tuberculous cases, many suffering from them having been sent to Sanatoria, but with newer means of diagnosis the differentiation should be more easily made. Dr. Lord of Boston considered that a very common cause of chronic cough and expectoration, perhaps even the commonest, is cardiac disease.

Dr. Howard Lilienthal recommended that thoracoplastic operations should be undertaken on the upper half first, rather than on the lower half first, which so far has been the general practice in two-stage operations; one advantage claimed is that sometimes the second stage is considered unnecessary. This method if found without objection might very well help to solve the hitherto unsolved problem of the lung with grossly and chronically diseased and cavitated upper third or more, but with clear lower half or two-thirds. Such a lung scarcely deserves total thoracoplasty, yet it needs something, and collapse of the upper half only may meet the indications.

Dr. Welles of Saranac agreed with Dr. Lilienthal and considered operation on the lower half the more dangerous. Dr. Archibald adduced the figures of his own series of ninety cases with a mortality from aspiration pneumonia of only 3 per cent all of which had been operated upon by the classical procedure of lower ribs first, as an argument against the proposed change.

Dr. Willis Lemon, of Rochester reported the cutting of the phrenic nerve experimentally in dogs. Their vital capacity was found very little reduced. After a pack of dogs had been run down and up hill, though not to exhaustion, a jury could not distinguish which dogs had had left phrenic nerve severed, or right, or both, or neither. Aspiration was not abolished when the nerve was cut. The nerves degenerated, and at post mortem the diaphragm was flaccid and translucent. Conclusions were that cutting the phrenic nerve is a simple and safe procedure. The lung is reduced in size but normal functions go on as usual. Aspiration is not prevented.

Phrenicotomy, Dr. John L. Yates considers of value not so much in the collapsing of the lung as in putting it at rest, and therefore, he argues, increasing the blood supply. He would advise the performance of phrenicotomy to give more blood to a diseased lung, and transfusion to give better blood. These measures he considers of great value.

Of abnormalities of the diaphragm Dr. Frederick Lord of Boston discussed eventration which it was generally agreed might rather be called elevation of the diaphragm since in this condition abdominal organs did not really pass through the diaphragm. Dr. Leon Le Wald of New York presented films showing the congenital absence of the left half of the diaphragm, differentiating this from hernia and elevation of the diaphragm. Dr. Packard discussed mediastinal hernia as a result of artificial pneumothorax which he considered not uncommon though not often recognized.

The Presidential address was an historical description of the Hotel Dieu of Paris in the 17th century, and was illustrated by slides made from old wood cuts.

D. A. STEWART

On November 16th Dr. H. A. Lafleur entertained the members of the Lafleur Reporting Society at dinner, on the occasion of their opening meeting for their fourth year's activities. This Society was formed in 1923, for the purpose of helping its members to keep in touch with current literature, each one having to read a paper covering some special phase of medicine in the course of the season. Dr. Lafleur kindly allowed his name to be used in association with the formation of the Society; several of its members were his former housemen in the Montreal General Hospital.

The Montreal Ophthalmological Society held its regular fall meeting on October 14th, at the McGill Medical Building.

This Society, which was founded in January, 1922, was formed for the object of promoting the study of science, and the art of ophthal-

mology, and to bring about a closer association both professionally and socially of the ophthalmologists of Montreal and district. It has the distinction, probably unique in Canada, of recognizing both English and French as its official languages. The President for this year is Dr. F. J. Tooke, and the Secretary Dr. Geo. Badeaux.

Association Notes

BE ON YOUR GUARD

From time to time, the medical profession in Canada is circularized by the Union Mutual Casualty Company, with home office at Des Moines, Iowa, a concern which writes disability insurance by mail. On the bottom of their letter head, appears this statement: "Fully authorized to write disability insurance by mail in the United States and Canada." On two occasions, I have asked this company to give me their authority for stating that they are authorized to do business in Canada. No satisfactory reply has been received. The Department of Insurance at Ottawa advises that the Union Mutual Casualty Company is not and never has been licensed to transact business in Canada, and, therefore, Canadian policy holders have no government protection in regard to policies which they may place with this company. Members are advised to place their insurance with companies enjoying Canadian licenses; and, if you are in doubt as to whether or not any insurance company offers you federal protection, an inquiry directed to the General Secretary of the Association will receive prompt attention.

T. C. ROUTLEY

Small Boys and Westminster Bridge.—*Pro Re Nata* writes: I was interested to see an account in the public press of a small boy who put his head through one of the trefoil openings in the side of Westminster Bridge and could not get it back again. In 1900, whilst passing over the same bridge, I saw a boy in exactly the same predicament. He was surrounded by a big crowd and two policemen were busy smearing his head with soft soap in an endeavour to get him out. I offered my services and was told by one of the policemen to mind my own business and "get away out of it." This I did, having one or two matters to attend to in the Strand, and on my return two hours later was surprised to see the poor little fellow in exactly the same position but very much the worse for wear and whimpering freely. I accordingly went to one of the policemen and suggested that, as they had been unsuccessful and as the boy was showing signs of considerable exhaustion, I might now be permitted to make an attempt to extricate him. At the time they were using a file in an endeavour to enlarge the opening. "All right," said the constable; "if you think you can do better than we can, have a go." Speaking obstetrically, the boy had obviously inserted his head in a position of extreme flexion and, after getting it through the opening, had extended it. This could be seen plainly on looking over the side of the bridge, and it was, in fact, the only position in which he could maintain himself fairly comfortably. It was the problem of the after-coming head. I accordingly flexed his head strongly upon his chest. To get his chin well down to his chest I had to push him a little further through the hole, as his tendency was to pull back and so keep up extension. It took just over half a minute to extract him, amid loud cheers from the crowd.—*Brit. Med. Jour.*, July 17, 1926.

The history of Egypt has been pushed back to a period so remote that by comparison Rameses and King Tut departed this life only yesterday. Dr. K. S. Sandford told how ancient river terraces of the Nile, formed during the days when all of Europe and most of North America were held in the grip of the glaciers, somewhere between a hundred thousand and a quarter of a million years ago, have yielded the rough stone implements used by the low-browed Neanderthal race. Three distinct types of weapons, the Chellean, Acheulean and Mousterian, in three successive terraces, testify to the high antiquity of man in Egypt.

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Abstracts from Current Literature

MEDICINE

Cases of Renal Infection in Pulmonary Tuberculosis. Medlar, E. M., *Am. J. Path.*, September, 1926.

It has been laid down by some writers that renal tuberculosis does not heal. Dr. Medlar takes issue on this point, and has collected evidence of definitely healed tuberculous lesions in the kidney. He argues that renal tuberculosis with cavitation may be assumed to correspond to the stage in the pulmonary form of the disease in which there is cavitation. But all cases of pulmonary phthisis do not go on to cavitation, and it seems probable that the same is true of renal phthisis.

His evidence consists of kidneys taken from patients dying of pulmonary tuberculosis, and with no clinical signs of renal involvement. Thirty cases were chosen, in all of which there was tuberculous caseation of the lung. A careful and extensive study of these was made by means of serial sections. It was thus possible to examine the various scars in the kidneys and to see how much or how little healing had taken place. The extensive sectioning also enabled him to find tubercle bacilli in lesions where single sections would have given negative results: the numbers of bacilli present in the scars varied greatly.

In all, 367 definite tuberculous lesions were studied, and tubercle bacilli were found in 265 of these. It is interesting to note that cortical lesions formed over 75 per cent of the number, medullary lesions 11 per cent, and corticomedullary about 13 per cent. The smaller lesions were of two main types: (a) vascular, which occurred chiefly in the glomerulus, and (b) those occurring in the tubules. The vascular type was the most common in this series: apparently tubular lesions are always secondary to vascular lesions which have developed to a point where destruction of tissue has taken place and tubercle bacilli have been discharged into the lumen of the tubule.

Dr. Medlar holds that the tuberculous lesion of the kidney does not differ from that in other organs of the body, as far as the defensive and reparative processes are concerned, and his evidence goes to show that under favourable circumstances renal tuberculosis can heal completely. He concludes that nephrectomy for renal tuberculosis should not be done before establishing the following facts: (1) evidence of considerable destruction and cavitation of the kidney; (2) the presence of tubercle bacilli in the urine on several examinations. Some authors believe that tubercle bacilli may be found in the urine without any lesions to account for them, a view not supported by Dr. Medlar, who points out that these may often be microscopic, and only involve a part of a glomerulus.

The urine from the opposite kidney should also be examined several times, and should show no tubercle bacilli. Finally operation should not be attempted before using treatment on the same basis as for arresting pulmonary tuberculosis.

H. E. MacDermot

Pulmonary Activity Greatest at the Apex and Least at the Base. Walsh, J., *Am. Rev. Tub.*, 1926, xlv, 142.

The author advances further evidence to support his contention that the apex of the lung is its most active part. This is in opposition to the general view heretofore that the greater activity both in the respiratory and circulatory functions is in the lower lobes. The author has before this published his reasons for thinking to the contrary and he now presents further arguments for his theory, and also goes a little further in stating that the base is actually the least active part of the lung, as regards function.

The most convincing argument he thinks is from the therapeutic point of view. One of the cardinal principles in treating tuberculosis is that of rest of the affected part. The apices of the lungs, however, are beyond all doubt very much more frequently diseased than the bases, which fact would imply a comparatively greater activity of function. Next, he has studied the size of the alveoli microscopically in normal lungs at different ages, and the net result of these observations is to show that the alveoli are practically the same throughout the lung of the newborn baby, and gradually increase in size, and this increase is greater at the apex than at the base. This would therefore point to greater functional activity at the apex.

The development of emphysema, also, is taken to indicate a greater activity at the apices. The apical alveoli are shown to be in a condition of greater distension by physical signs, by x-ray findings, and at post mortem. The emphysematous chest, again, shows enlargement from the apex downwards.

Other arguments adduced are, the increasing development, in size and number of hæmatogenous miliary tubercles from the base upward; the ready growth of tubercle bacilli at the apices due to the greater æration at that point (tubercle bacilli being ærogenous); and the pathogenesis of lobar pneumonia in that it develops by predilection in the part of the lung where the

respiratory activity is least and the circulation becomes more stagnant.

Due weight is given to the statement made by Tendeloo that the lymph flow is most active at the base and least active at the apex, which allows for the tubercle bacilli to be deposited there more readily. But Dr. Walsh desires confirmation of this statement, and also asks whither the more rapid flow of lymph at the base does take the tubercle bacilli which it is supposed to wash away. H. E. MacDermot

A Comparative Study of Tests for Hepatic Function in Certain Diseases of the Hæmatopoietic System. Greene, C. H., and Milton, C. H., *Arch. Int. Med.*, August, 1925.

In beginning this study the authors tell us that recent experimental work has shown that a dog may become jaundiced after the complete extirpation of the liver and that the injection of hæmoglobin increases the rapidity with which the icterus develops, thus pointing out that at least to some extent the liver must be considered as an excretory organ for bile pigments.

Their report is based on a study of a carefully selected series of cases of hæmolytic jaundice and certain other diseases of the hæmatopoietic system. The tests used were fructose tolerance, serum bilirubin, the Van den Bergh and phenoltetrachlorphthalein. As a result of their studies they find that functional disturbances in the liver are apparently not sufficiently great to be of clinical significance in most diseases of the hæmatopoietic system, hæmolytic jaundice, pernicious anæmia, polycythemia, leukæmia or splenomegaly of the Gaucher type. The greater number of the tests for hepatic function studied did not show significant changes from the normal.

An increase in serum bilirubin is of value in the differential diagnosis between hæmolytic anæmia and the ordinary secondary types. In cases of hæmolytic icterus and pernicious anæmia, changes in the serum bilirubin serve accurately to indicate changes in the severity of the hæmolytic process. The serum bilirubin is equally of value in following the course of a hæmolytic crisis after transfusion, or the artificial hæmolytic crisis produced by the therapeutic use of phenylhydrazine. The serum bilirubin in these instances is an index to the severity of the hæmolytic process, rather than to disturbances in the liver.

The indirect diazo-reaction or Van den Bergh when associated with an increase in the serum bilirubin is characteristic of an icterus of hæmolytic origin and is of diagnostic value. The frequent association of gallstones with hæmolytic jaundice will serve to account for the occasional direct Van den Bergh reaction obtained in the latter condition.

In cases of splenic anæmia, particularly, the phenoltetrachlorphthalein test shows changes that may apparently be related to the severity of the cirrhotic changes in the liver. Under these conditions the test would seem to be of some diagnostic and prognostic value.

L. C. Montgomery

Hysterical Dysphagia. Moersch, H. J., and Conner, H. M., *Arch. of Oto-Laryng.*, 1926, iv, 112.

The authors insist that there is a definite group of cases of hysterical dysphagia, characterized by a sense of obstruction at or about the œsophageal opening into the stomach, associated almost always with pallor and secondary anæmia, and frequently with enlargement of the spleen. They review a series of sixty-five cases observed at the Mayo Clinic, all of which showed the above symptoms. All these patients were women, the average age being forty-five years. The average duration of symptoms was eight years, the longest being for thirty-four years and the shortest for one month.

The dysphagia usually begins suddenly, and there may be periods of remission. Relapses are usually instigated by mental or physical fatigue. The pallor, which is regarded as one of the outstanding signs resembles that of pernicious anæmia. It is apparently of the secondary type, with a low hæmoglobin index, and seems to be due in all probability to dietary insufficiency. Loss of weight was not constant, the average loss being only eight pounds.

Enlargement of the spleen was found in twenty cases, but no explanation of the condition is offered.

Treatment consisted in passing a plain œsophageal sound into the stomach, guided by a previously swallowed silk thread. The size of the sound is immaterial, since it is admitted that the treatment is purely suggestive. Afterwards, the patients are encouraged to eat solid food. The results were found to be very gratifying. Recurrences took place in some cases due to later unfavourable conditions, but a second passage of the sound was found to give relief.

The differential diagnosis offers many problems, but the following points are taken as guides: (1) duration of the symptoms; (2) anæmia without loss of weight; (3) symptoms as marked on the first day as during the course of the trouble; (4) ease in swallowing liquids and soft foods; (5) enlargement of the spleen in more than 30 per cent of cases; (6) negative results of clinical and laboratory examinations, and the absence of evidence of tuberculosis or syphilis. H. E. MacDermot

SURGERY

Report on Antistreptococcic Serum. Novak, E., *J. Am. M. Ass.*, Jan. 16, 1926.

Dr. Novak points out that in the thirty or

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thirty-five years during which antistreptococcic serum has been used therapeutically, there has been no definite crystallization of opinion as to its value, or otherwise. If it is of value he thinks it ought to be more generally used than it is; if it is of no use, the fact ought to be made clear. In either case, the rank and file of the profession would welcome a definite pronouncement on the subject.

Steps were therefore taken to learn what the opinion was of clinicians generally, and Dr. Novak presents in this paper the results of letters sent to a selected group of twenty-five outstanding men. Twelve of the group were general surgeons; thirteen were identified with gynæcology and obstetrics. They were asked for "a general personal estimate" of the value or lack of value of antistreptococcic serum.

The replies fell into three groups: (1) sixteen were unequivocally unfavourable. The expressions of opinion varied, but left no doubt at all as to their meaning. (2) One reply stated that the author "did not know anything about the serum." (3) Eight felt that in certain cases or for certain indications it might be of use, but some of the answers were almost as condemnatory as those of the first group. One man thought that the serum "was just about ready to develop into something of value;" another, that he had got results, or thought he did, in some instances; another, that he thought it did good in mild cases, but was entirely valueless in acute sepsis.

In no cases was there any sign of enthusiasm for the serum. H. E. MacDermot

Functions of the Biliary Passages in Relation to Their Pathology. Wilkie, D. P. D., *Lancet*, October 2, 1926.

The author begins with a review of the anatomy and physiology of these passages, which he thinks is necessary to the understanding of the different degrees of pathological change. The gall-bladder is usually 9 cm. long, and has a capacity of 50 c.c. The muscular coat of its body is fasciculated in the neck and cystic duct and is arranged in longitudinal and circular layers, producing a valve which is capable of opening and at least partially closing. The nerve supply is linked with the phrenic nerve, hence the shoulder pain so often present in biliary colic.

The author then draws attention to the existence of what amounts to a sphincter just above the ampulla of Vater named after Oddi, its discoverer; this will withstand considerable pressure in the biliary passages and relaxes under various stimulations some nervous and some chemical, such as food, peptone, magnesium sulphate, etc., introduced into the duodenum. The gall-bladder also has the power to contract and relax, so that the flow of bile is affected by various factors. In the gall-bladder the bile coming from the liver is affected in two ways. It is concentrated and various substances are added to it, mucus, cholesterin, etc. Dr. Wilkie shows how the fluid from the bile ducts dilutes the product of the liver cells and, since this fluid is poured out at a higher tension, disease or absence of the regulating gall-bladder results in the bile being reabsorbed and this pale watery fluid filling all the passages.

Again, after an operation for gall stones, spasm of the sphincter of Oddi may cause retention of the bile, and an attack of biliary colic severe enough to make one suspect an undiscovered gall stone, which of course, is not the explanation.

We are then reminded of the different types of gall stones; (1) the single radiate cholesterin stone; (2) the pure pigment stone; (3) the septic type. The last has always been preceded by inflammation which may be caused by either of the two previous types of stone. Another cause, and in the author's opinion, a very important cause of gall-bladder inflammation is simple stasis of the bile passages, and the blame for this should not be placed on pregnancy and other "pressure" conditions of the abdomen but on the existence of muscular spasm either at the sphincter of Oddi or at the neck of the gall bladder itself, or at both situations. In addition, spasm of the sphincter of Oddi can force the bile back into the pancreatic duct and be responsible for the pancreatitis which so frequently accompanies inflammation of the bile passages. A gall bladder with any change in the muscular tone of its walls whether hypertonic or hypotonic is much more likely to allow inflammation to gain a foothold. P. M. Macdonnell

Calculi of the Salivary Glands and Ducts. Harrison, Guy R., *Surg., Gyn. & Obst.*, Oct., 1926.

There have been reported from 1825 to the present time 375 cases of salivary calculi, giving one the impression which is backed up by reports from different observers that the condition is rare. Garretson, however, regarded their occurrences as common. In about two-thirds of the cases, the submaxillary was the gland involved. Chemically they are found to contain calcium phosphate, 60 to 65 per cent; organic matter, 25 per cent; calcium carbonate 6 per cent; and traces of iron and magnesium. Symptomatically the patients fall into three groups: (1) those who when eating, particularly acids, have pain and swelling in the affected gland. The stone is usually small and acts as a ball valve. (2) Those who suddenly have pain and swelling with an elevation of temperature. Chronic inflammation is usually present. (3) Those who have the board-like induration due to

periglandular inflammation, of which a suppurative cellulitis is a sequel.

The most common classical symptom is the so-called salivary colic produced by taking food. Calculi may be present for years without producing symptoms, the majority of patients seeking relief for superadded infection. Stenosis of the ducts produce many signs of stones. Diagnosis is best established by palpation. Probing the duct is of doubtful value. Puncturing with a strong hypodermic needle, simultaneously injecting local anæsthetic, is a useful procedure. X-ray plates are positive in 75 per cent to 80 per cent of cases, the smallness of the stones in some cases being the cause of failure. If the stones are in the submaxillary or sublingual, extirpation of the gland is indicated, and may even be indicated in some cases of stone in the ducts, especially where there has been marked inflammatory changes. Persistent salivary fistulæ are thereby prevented. R. V. B. SHIER

Carcinoid Tumours of the Intestines. Wolfer, J. A., *Surg., Gyn. & Obst.*, October, 1926.

Usually found in the appendix or small bowel, carcinoid tumours grow slowly, are clinically non-malignant, but possess histologically characteristics of carcinoma. The stimulus for the paper was a case which is reported in detail. The author goes on to say that carcinoid tumours are found most often in the appendix, usually in a diffuse form, but in some cases a distinct nodule. In the cases reviewed in which the tumour was found in the small intestine, the majority were in the ileum and always on the anti-mesenteric border. When the intestine was involved there were no demonstrable symptoms, but in the cases of appendiceal involvement, the diagnosis was invariably chronic appendicitis. From time to time cases believed to be carcinoid tumours have been reported in which metastases have occurred. The following typical histological picture is the one accepted: "The cells vary in size, some being cylindrical, other cuboidal. The nuclei are oval to round, stain deeply, and are centrally placed in the cell, or lumenward in the alveoli. The cytoplasm stains indifferently. Small blood vessels and capillaries are found in the cell clusters, and the cells are often arranged around the vessels in rosette formation. Gland-like formations are often found, some containing lumen areas in the centre."

It has been established that the carcinoid cell belongs to the chromaffin system, and that carcinoid tumours originate most frequently in the Schmidt cell of the crypt of Lieberkuhn, but may arise in misplaced Langerhans islands. The tumour may infiltrate surrounding tissue and yet be benign, but under circumstances not yet understood may be of malignant nature and produce metastases. R. V. B. SHIER

PÆDIATRICS

Lead Poisoning in Children, With Notes on Therapy. McKhann, C. F., *Am. J. Dis. Child.*, September, 1926, xxxii, 386.

Pica is the most frequent forerunner of lead poisoning as it is of relatively frequent occurrence, and may result in repeated ingestion of small amounts of lead. The essential picture in lead poisoning is an anæmia associated with gastro-intestinal disturbance, such as loss of appetite, constipation, abdominal pain and vomiting. The anæmia may become quite marked. It is characterized by reduction in the erythrocyte count with the appearance of basophilic stippling in the cells. Anæmia may be the only sign in mild cases. Lead colic as such is seldom recognized in children. Loss of appetite and constipation are early and very marked symptoms. Vomiting, often of a projectile type, appears in more pronounced cases. The characteristic lead line is only occasionally present in the disease in children. In severe cases neuritis and encephalitis occur, especially in lead poisoning of long duration. Vomiting, headache, stupor and convulsions are prominent features of the latter. The prognosis of this severe form of the disease has been considered almost uniformly fatal. The spinal fluid is clear, under increased pressure and may show a positive test for globulin, a slight increase of lymphatic cells, or both.

It is the purpose of this paper to call attention to the unrecognized frequency of the condition and to detail experiences in treatment. The mechanism of transportation is similar to that of calcium, and circumstances favouring calcium deposition favour lead storage, and conditions effecting calcium removal likewise affect lead. Symptoms of lead poisoning occur when the metal is circulating in the blood stream, or when bound especially in the liver and brain. It is stored with bones in an inert form where it may remain indefinitely without causing symptoms. In the absence of severe symptoms "deleading", or the withdrawing of lead from the bones, and the hastening of its excretion may be attempted. This is done by the production of an acidosis and a low calcium diet; conversely in the case of one severely ill, the deleading process is reversed, to produce storage of the dissolved metal in the bones, by a diet rich in calcium and the administration of calcium in large doses. In the presence of persistent vomiting or convulsions, 50 to 100 c.c. of 2 per cent solution of calcium chloride may be given intravenously, until the convulsions have ceased. In young infants, in the presence of an infection, sufficient lead may again be liberated into the blood, to produce acute symptoms again. During the deleading process recurrence of symptoms should be watched for.

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The histories of several illustrative cases are quoted, and the method of treatment used in each case outlined. R. R. STRUTHERS

ANÆSTHESIA

Spinal Anæsthesia in Intussusception of Infants. Bailey, H., *Lancet*, September, 1926, xxv, 648.

This paper is based on fourteen operations on infants between the ages of five and thirty months. All the patients recovered except one. The standard dose of stovaine used was 0.2 cubic centimetres, but it varied with the weight of the baby. The injection was given between the second and third lumbar vertebræ with the baby in the lateral position, and the vertebral column well flexed. No cerebro-spinal fluid should be allowed to escape. The writer considers it dangerous to mix the anæsthetic solution with the cerebro-spinal fluid by repeatedly withdrawing and inserting the piston of the syringe. Half a cubic centimetre of pituitrin was injected subcutaneously to counteract the fall of blood pressure. Great emphasis is laid by the writer on the importance of having the stovaine dissolved in saline instead of in glucose solution.

W. B. HOWELL

Acetylene — Oxygen Anæsthesia in Gastric Surgery. Brandt, T., *Brit. M. J.*, August 14, 1926, 297.

The disagreeable smell of ordinary acetylene gas is almost completely removed in the process of purification necessary to render it fit for inhalation as an anæsthetic. Purified acetylene or narcylen should be administered with 30 per cent oxygen. As the operation proceeds the proportion of narcylen is reduced as low as 20 per cent or 30 per cent. With these low percentages there is generally less tension of the muscles than with a larger amount. Before a laparotomy a preliminary dose of scopolamine and morphine is necessary to ensure muscular relaxation.

An overdose is impossible. There is no effect on the liver or kidneys. After effects are very slight. Its disadvantages are that a cumbersome apparatus is required for its administration, and that it is expensive. W. B. HOWELL

Sul Comportamento Fisico Delle Soluzione Anestetiche Iniettate Nello Spazio Sotto-Aracnoideo. (On the Behaviour of Anæsthetic Solutions Injected into the Sub-Arachnoid Space.) Cernezzi, Aldo, *Archivio di Chirurgica*, 1926, xvi, fasc. 2, 237.

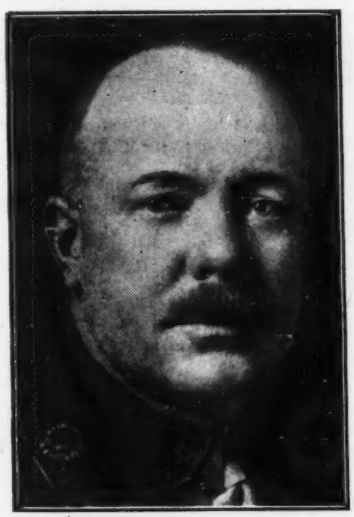
When an anæsthetic substance in solution is introduced into the sub-arachnoid space its diffusion through the cerebro-spinal fluid depends on the specific gravity of the solution, the force with which it is injected, and the position and movements of the patient. Cernezzi believes that the injection should be made with the least possible amount of force, since the velocity, direction and extent of the currents set up in the cerebro-spinal fluid cannot be controlled. The practice of drawing cerebro-spinal fluid into the syringe to dilute the anæsthetic solution is unsound since it is impossible to know how much cerebro-spinal fluid there is. If the amount (of cerebro-spinal fluid) is small, mixing in this way may cause an unduly wide involvement of nerves. The more cerebro-spinal fluid allowed to escape through the needle, the more often do symptoms of excessive diffusion occur upwards. If after an injection has been made with the greatest gentleness in the lumbar region, the patient is placed in the recumbent position, the anæsthetic solution will flow along the posterior spinal roots towards the dorsal region leaving the anterior roots unaffected. This movement is helped by a general movement upwards of the cerebro-spinal fluid which normally takes place when the sitting position is exchanged for the recumbent.

The fall of blood pressure during spinal anæsthesia is due partly to the action of the anæsthetic on the vasomotor fibres of the splanchnic nerves, partly to direct action on the bulbar centres, and partly to relative anæmia of the bulb. To prevent this fall caffeine should be injected hypodermically one hour before the hour for operation. W. B. HOWELL

Anything New Under the Sun? — From tablets found in the ruins of Nineveh and Ashur, it seems that the Assyrian King Aanapper (*circ.* B.C. 650), had become impatient with his physician's failure to relieve him of his distresses, and that the physician decided that a procedure quite familiar in A.D. 1926, must be adopted. The following is from the translation: "Continually the King has been asking why Arad Nana, his physician, has not made clear his disease, and has not cured him. Now Arad has sent a sealed letter, which he hopes they will read before the King. He will make a prescription; let the ceremonies be carried out by a Seer; let them bathe the King and straightway the fever will depart from the face of the King; let them apply to him oil, two or three times; at once the strength of the King will revive; the King shall place on his neck the salve Arad will send him. On the appointed day let the King be anointed; Arad will speak the truth as the King demands; the pains in his head, his sides, in his feet, have come from his teeth, and they must be extracted."—W. H. H.

Obituaries

Dr. J. D. McCullough died in Lindsay, Ontario, early in October after a long illness terminated by an angina of extreme severity. Born in Darlington Township, in the county of Durham in 1872, Dr. McCullough grew up on the farm cleared by his grandfather over one hundred years ago. He received his early education at the Mackenzie public school in east Whitby and at the Port Perry high school. Some years later he entered Queen's University where he graduated in medicine. After a few years of general work in Blackstock, Ont., Dr. McCullough left this practice to pursue his studies further in Edinburgh and there obtained the degree of F.R.C.S. and F.C.S.; and later passed the examinations for the membership of the College of Physicians of London. On returning to Canada he settled in Lindsay and in a remarkably short time acquired the reputation of being an excellent surgeon. He conducted as well a large practice and was known as an untiring worker and as one of those generous practitioners who never refused the call of a fellow man in distress.



DR. J. D. McCULLOUGH

At the outbreak of the war, Dr. McCullough went overseas with the Queen's University unit as chief of the surgical staff, serving both in the east and in France where he carried through the enormous amount of work demanded in the surgical side of a general hospital, which in an emergency could expand to two thousand or more beds; his energy, his good nature and his skill made the reputation of the Queen's unit which continued in active operation long after many other hospitals had been closed on account of the enemy's bombing raids. His steadiness in these trying times meant much to all in the district. Enlisting "for the duration" Dr. McCullough steadily refused to listen to any suggestion that he should return to his peace time activities, and his excellent surgical opportunities in the Lindsay district; he remained in France to the end of the war. Nine months after the armistice he resumed work in Lindsay, confining his attentions to surgery and in a few months seemed destined to gain a commanding position in the surgery of the province. Unfortunately even by this time, signs of the illness which eventually overcame him had become evident, and during the last six years of his active life, he had to fight a crippling disability. Ever a real soldier he smiled through his pain, and showed always a face ready for the day's work, allowing his associates to believe that the old vigour and endurance was unimpaired. Few of his professional intimates realized that the attacks which at times seized him in the midst of work were anginas of a most severe nature. Last spring it became apparent to the doctor himself that he could no longer carry on even in general surgery, and he planned to retire into consulting work. A six months' rest gave him much encouragement but in the midst of his preparations for this less active existence the final summons came in the form of a coronary thrombosis with its agonizing associations.

Few men will be more missed in the profession, for Dr. McCullough was that happy combination of energy and kindliness which goes far to smooth out little professional kinks; able, conscientious, unselfish, he radiated a sincere geniality which made him ever a welcome guest; his geniality and his insistent personality usually made harmony prevail in many gatherings. No finer type of man has ever practised medicine, and the people amongst whom he lived and worked are to be sympathized with in having lost a councillor and a friend.

Dr. John Dunfield of Petrolia, Ontario, died October 1st in his seventy-ninth year. He graduated with first class honours from Trinity Medical College, Toronto, in 1878 and spent his extra-mural year in Arkona with Dr. Brett, afterwards Lieutenant-Governor of Alberta.

Dr. Dunfield was born in Carleton County, taught school at the age of fifteen, and in the early days of the oil boom came to Petrolia, where a fortunate oil venture provided him with ample means to obtain his medical education.

He commenced practice in Petrolia and from the first enjoyed one of the largest practices in the County. He had boundless energy and took an active part in all civic affairs, having held at different times most of the public offices from councillor to mayor and chairman of the Board of Education. Dr. Charles Dunfield of Windsor is a son.

J. D. DUNFIELD

Dr. George Graham, chief coroner of the city of Toronto, and a member of the staff of St. Michael's Hospital died on November 8th after an illness of several months.

Dr. L. N. MacKechnie, one of the oldest and best known physicians of Vancouver, died at St. Paul's Hospital on October 3, 1926. He was born at Paisley, Ontario, on August 19, 1864, where he received the earlier part of his education; later he attended Woodstock College. He entered Toronto University Medical School in 1888 and graduated in 1892. He afterwards took a post-graduate course in ophthalmology. In 1893 he went out to Victoria, B.C., and practised there until 1895, when he settled in Vancouver and soon built up a large general practice. Dr. MacKechnie acted as port physician for the Port of Vancouver for a number of years. A conscientious and skilful practitioner, he

inspired confidence in his patients, by whom he was much esteemed, not only for his medical care, but for the many little extra attentions which he was constantly giving them. He was uniformly kindly, courteous, generous and ready to help a confrère. There was nothing of meanness or pettiness in his nature. For many years he was at the head of an extensive and active practice but for some time past a good part of his time was devoted to private business. He is survived by his widow, two daughters and one son, Hugh MacKechnie, now in his third year of medicine at Toronto University. F. X. McP.

Dr. A. R. Turnbull, pioneer physician and surgeon of Moose Jaw, passed away at the family residence on November 9th. Dr. Turnbull came to Moose Jaw in 1887 and continued in active practice until 1915, when he retired. During the war he was medical health officer of that city. For the past two and a half months he had been in poor health.

News Items

ACKNOWLEDGEMENTS

We have received a copy of the September number of the *British Journal of Actino-Therapy*, and note the appeal in the editorial for the use of this method of treatment in connection with older and more recognized methods. This issue is therefore devoted largely to this method of treatment. It also contains, however, several papers dealing with this lack of co-operation between the members of the profession and the actino-therapist.

The Marquette University, Milwaukee, Wis., has published its third *Research Bulletin*. It includes publications from the Marquette School of Medicine for the years 1922-24, and covers a wide field of medical research, as well as several papers on subjects of general medical interest.

The *Quarterly Bulletin* of the Millbank Memorial Fund has devoted the greater portion of its October number to a description by Sir Arthur Newsholme of the New York Health Demonstrations in Syracuse and Cattaraugus County. Sir Arthur offers suggestions by which, he thought, the present activities could be made more effective. He dwells on the value of increased attention to the physical welfare of mothers and children; and regards as of equal importance the need for proper facilities for the treatment of existing disease as a means of its prevention in the future.

In the *China Medical Journal* for September we note amongst other original articles an interesting discussion on neuropsychiatry in China by J. L. McCartney.

Other publications received are as follows: The Report of Department of Health, Montreal, 1925. Eleventh Annual Report of the Providence City Hospital. The 1927 edition of the Wm. Wood visiting list. This is a very neat volume and contains a considerable amount of miscellaneous details regarding dosage.

GREAT BRITAIN

The Celebration of the Tercentenary of Francis Bacon

The Tercentenary of Francis Bacon was celebrated at the University of Cambridge on October 5, when, at a special congregation, the chancellor of the university (the Earl of Balfour) conferred the degree of doctor of law (*honoris causa*) on William Searle Holdsworth, K.C., D.C.L. (Oxford), Vinerian professor of English law in the University of Oxford, and the degree of doctor of science (*honoris causa*) on Sir Ernest Rutherford, O.M., M.A., of Trinity College, Cavendish professor of experimental physics, president of the Royal Society.

About 1,500 invitations were issued for the garden party in Trinity College, and the guests were received by the master, Sir J. J. Thomson, and the vice-master, the Rev. Dr. St. John Perry, in the bowling green behind the Great Court. A lecture was delivered in the evening on the philosophy of Francis Bacon.—*Science*, Oct. 22, 1926.

SOUTH AFRICA

We note with interest the following account of the policy adopted regarding a general medical library centre in the Witwatersrand (*Med. Jour. of South Africa*, July, 1926).

Monday, July 12th, 1926, was a day of some significance in the medical history of the Witwatersrand, for it marked, in the transference of the Hospital Library to the Medical School, the ultimate achievement of the vision of an enthusiastic group amongst the members of the Transvaal Medical Society just about thirty years ago.

There is, perhaps, no graver need amongst the profession in this area than that of a common library centre, and in taking over the responsibility of caring for the Hospital Library and its growth, the University of the Witwatersrand is about to render a service to the profession in which it should have the deep interest and staunch support of the profession itself.

It is amply recognized that the provision of a full-time librarian is essential to the progress of the library. Whether a librarian can be provided depends upon the extent to which the new policy receives the financial support of the local medical organizations.

GENERAL

The Jubilee of Professor Schmiegelow

On Oct. 13th Dr. Ernst Schmiegelow, profesor of oto-larynology in the University in Copenhagen, celebrated his seventieth birthday by delivering his last lecture at the Rigshospital, thus finishing his active career there both as head of the clinic and as professor of his specialty. That he is not without honour in his own country was shown by the manifestations of esteem and regard from his townsmen and compatriots, who presented him with a striking portrait of himself painted by the well-known Danish artist, Henningsen. In addition, the brotherhood of laryngologists in other lands united to present him with a bas-relief portrait in bronze, by the Swedish artist, Gosta Carrell. Numerous colleagues from Sweden and Norway were present in testimony of the international character of the occasion.

The Psycho-Clinic for Infancy Research at Yale University

The Yale Psycho-Clinic for Infancy Research is to extend its programme of psychological investigation and its clinical service for young children. The development of this work is made possible by a gift from the Laura Spelman Rockefeller Memorial. The staff of the Psycho-Clinic, which is under the direction of Dr. Arnold Gesell, has been enlarged by the appointment of several research associates, while the clinic itself is now housed in separate residential quarters at 52 Hillhouse Avenue. The clinic will devote itself for a period of years to the consecutive study of mental development in normal infants. The problems under investigation include the nature and origin of individual differences, correlations with physical characteristics, variations in rate of mental growth, norms and methods of developmental diagnosis in infancy. The program contemplates a co-ordination of several lines of research and combines a psychological and medical approach to the problems of infancy in their relation to human behaviour.

Death of Kraepelin, the Psychiatrist

Prof. Emil Kraepelin, the well-known psychiatrist, died unexpectedly, in Munich, after a short illness, at the age of seventy. Kraepelin pursued his medical studies in Würzburg. After completing his university studies in 1878, he began his life work in the clinical institutions of Munich and Leipzig. In 1886, he accepted a call to a chair in the University of Dorpat, whence he removed in 1890 to Heidelberg. In 1903, he transferred his allegiance to the University of Munich, where he founded the Deutsche Forschungsanstalt für Psychiatrie, which was later absorbed by the Kaiser-Wilhelm-Institut. After his enforced resignation on reaching the age limit, he was allowed to continue his researches in the institute. Kraepelin has sometimes been referred to as the founder of modern psychiatry. In his investigations of psychic disturbances, he entered on unbeaten paths, making use of the methods of experimental psychology in order to study with greater precision the psychic processes. Kraepelin was the first to introduce any systematic classification into the chaos of mental diseases and to prepare the way for the now generally recognized division into the manic-depressive and the schizophrenic groups. His text-book on psychiatry has become a classic. He took an especially active part in the crusade against alcoholism. Among his lesser publications are the following: the effect of medicaments on psychic processes, the influence of acute affections on the genesis of mental disease, and the psychology of crime.

The College of Physicians of Philadelphia announce that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Senor Alvarenga, and amounting to about three hundred dollars, will be made on July 14, 1927, provided that an essay deemed by the Committee of Award to be worthy of the Prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published. The essay should represent an addition to the knowledge and understanding of the subject based either upon original or literary research. They must be typewritten, and in English acceptable for publication without necessity for editing by the Committee.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelop having on its outside the motto of the paper and within the name and address of the author. It is a condition of competition that the successful essay or a copy of it shall remain in possession of the college; other essays will be returned upon application within three months after the award. The Alvarenga Prize for 1926 has been awarded to Dr. P. S. Pelouze and Dr. Fredk. S. Schofield, Philadelphia, for their essay entitled "The Gonophage."

NOVA SCOTIA

Dr. H. G. MacLeod, after a period of graduate study at Cleveland, has returned to Nova Scotia and established himself in practice at Middleton.

Dr. George W. Smith, formerly of the staff of the Nova Scotia Sanatorium, has been appointed to the staff of the Provincial Department of Health. His duties will be particularly in connection with tuberculosis control.

A few cases of infantile paralysis have been reported, from widely separated localities, during recent weeks. It is felt that the "outbreak" is seasonal, and that it is unlikely to be prolonged or to assume very serious proportions.

Dr. A. M. Marshall, who had been practising for some years at Petitcodiac, N.B., has recently removed to Halifax and has taken up practice there.

In "Public Health Notes" for October, the Provincial Health Officer announces that, on account of the present concentration of effort on the scheme for tuberculosis control, the Department finds it impossible

to carry out the "Seymour Plan" in Nova Scotia, but is watching its progress elsewhere with sympathetic interest.

The Festival of St. Luke, "the beloved physician", was observed in accordance with established custom by a special service at All Saints' Cathedral, Halifax, on the evening of October 17th, to which all Halifax physicians were invited. The Rev. Professor Stanley Walker preached an eloquent sermon, appropriate to the occasion.

A summary of the vital statistics of Nova Scotia for the month of June indicates that there were 923 births and 509 deaths. Deaths from pneumonia, tuberculosis and influenza were, in each case, in considerable excess of the corresponding month of 1925; in respect of other communicable conditions the comparison is favourable. The infant mortality rate was 62.8—slightly higher than in June of 1925.

A bronze tablet has recently been placed in the Dalhousie University Public Health Clinic which bears the following inscription:

THIS TABLET WAS ERECTED BY
THE BOARD OF GOVERNORS OF DALHOUSIE UNIVERSITY
TO PERPETUATE THE MEMORY OF
DONALD ALEXANDER CAMPBELL,
M.D., C.M., LL.D.

a distinguished and beloved physician, noted for his unremitting devotion to the practice of his profession and for his constant advocacy of high professional standards. He was for many years a valued member of the staff of the Medical School, and crowned a singularly unselfish life by the liberal endowment of a chair of anatomy in memory of his son, D. G. J. Campbell, M.D., C.M., who died at an early age having already given promise of a brilliant career.

1852-1919

The Osler Medical History Club of Halifax held its first meeting for the session at the residence of Professor John Cameron on the evening of October 30th, when Dr. Cameron read a most interesting and instructive paper on Vesalius. Among the exhibits shown was a copy of Abregé D'Anatomie, by J. B. Crepy, published in 1760, in which a number of illustrations of De Fabrica are reproduced, and in which it is stated that these were from drawings made by Titian. Dr. Cameron considered that this is of interest in that Sir Michael Foster and other recent critics have attributed the drawings to Calcar rather than to Titian.

The fourth annual meeting of the Western Kings Memorial Hospital Association, Berwick, was held on October 18th. All reports presented were of a very encouraging nature, and indicated growing appreciation of the hospital by the community. Dr. H. K. MacDonald, of Halifax, was present by invitation, and spoke on the "Community aspect of the small hospital," pointing out benefits which are likely to escape notice. The community hospital, he said, can be a centre for radiating health and for instigation of efforts at improvement of the public health, as well as a place where sick people may be treated. Its educational value is great, both directly and indirectly, not only to nurses in training and to members of the medical staff but also to patients and visitors. As such things come to be more fully realized, the public will become more and more ready to give the support necessary for efficient maintenance.

The new building for the Colchester County Hospital, at Truro, was opened with appropriate ceremonies on September 21st. This building, of fireproof construction, impressive in its architectural features and occupying a commanding site, replaces the wooden structure which has served as a hospital for several years. The new institution is admirably planned and well equipped. The operating-room with its equipment is dedicated to the memory of Dr. William Scott Muir; and the equipment of the x-ray department to the memory of Dr. Alexander Crawford Page. Both of these men have been dead for many years (Dr. Muir died in 1902; Dr. Page in 1899), but they possessed those sterling qualities of heart and head which are not quickly forgotten, and all of the Truro folk who lived with them have good reason to cherish their memories. Prominent among those who promoted the hospital idea in Truro and who have been instrumental in its materialization is Dr. E. A. Randall, a member of the dental profession, who has been president of the hospital trust for some years.

NEW BRUNSWICK

Dr. and Mrs. C. M. Pratt returned on October 19th from a vacation spent in New York and Philadelphia. The doctor's vacation consisted chiefly of visits to centres of medical interest.

Among other visitors who were welcome in Saint John during the meeting of the Canadian Board of Trade, was Dr. J. C. Simpson of Summerside, who accompanied the Prince Edward Island delegation to this first meeting of the Board.

Dr. W. W. Warwick, Dr. R. B. Pendrigh, Dr. O. B. Evans, formed the local contigent to represent us at the McGill reunion held recently.

There has been for some time a determined agitation for increased hospital accommodation at the City Hospital in Moncton. On October 21st, a committee was appointed from the Ladies' Hospital Aid to wait upon the Hospital Board, and again urge the importance of new hospital accommodation.

Those who attended the meetings of the American College of Surgeons in Montreal were Dr. G. A. B. Addy, Dr. A. E. Macauley, Dr. L. DeV. Chipman, Dr. F. T. Dunlop, Dr. J. R. Nugent, Dr. D. C. Malcolm and Dr. L. M. Curren from Saint John.

Dr. A. M. Marshall of Petitcodiac has given up his practice at that place and is moving to Halifax. He is succeeded at Petitcodiac by Dr. W. Pullins who previously practised at Newtown, Newfoundland.

Mr. R. H. Gale, Superintendent of the General Public Hospital, Saint John, N.B., attended the meeting of the American College of Surgeons at Montreal.

A. STANLEY KIRKLAND

QUEBEC

According to statistics compiled by Dr. S. Boucher, Director of Public Health, infant mortality for the first ten months of this year shows a diminution of 250, as compared with the same period last year, a decrease of 12 per cent. The total deaths so far this years number 7,799, while in 1925 for the same period, they were 7,536, in 1924, 7,327 and in 1923 7,715. Infantile mortality figures are as follows: Deaths under one year of age during 1926, 1,603; 1925, 1,850; 1923, 1,818. Child mortality under ages of two years is as follows: 1926, 1,954; 1925, 2,281; 1924, 2,230; 1923, 2,303. Child deaths under five years of age are given as follows: 1926, 2,291; 1925, 2,559; 1924, 2,519; 1923, 2,682.

The city has undertaken to study a project for the establishment of a sanatorium for tuberculous patients, to which it is asked to contribute $200,000 a year, following representations made by an influential group of citizens, doctors and representatives of the estate of the late Trefle Berthiaume. The project sponsored by Sir Lomer Gouin, Hon. Geo. A. Simard, Hon. Pamphile DuTremblay, Zenon Fontaine, and others, calls for the erection, near Montreal of a sanatorium for tuberculous patients with accommodation for 500 beds, at a cost of some $3,000,000. It is to bear the name of the "Berthiaume Sanatorium" and members of the Berthiaume family would be the chief contributors to its funds. It is stated that the province has promised to endow the institution with $50,000 a year, while the city is asked to contribute $200,000 a year for thirty years, to offset sinking fund and interest. It was estimated that the cost per bed would be $6,000, to found and establish a maintenance fund; the hospital would be equipped with a modern laboratory, and it is stated that the Rockefeller Institute has promised to give its support to the plan.

All the most modern apparatus for the treatment of cancer operated by four experienced technicians who have been trained in Europe, is now at the service of the people of this city. Thursday the Montreal Radium Institute was officially opened by Mgr. A. J. V. Piette, Rector of the University of Montreal, though the institute has been functioning as a hospital and clinic for several weeks. Dr. J. Ernest Gendreau is director of the institute, which at present can accommodate thirty patients. An unlimited number of patients can be treated at the clinics.

Further preventive measures against the spread of tuberculosis in Montreal are urged by city aldermen who have prepared a motion for presentation at its next council meeting, asking the city to establish anew a department for the analysis of sputum in suspected cases. Some years ago the City Health Department conducted this branch of research in connection with its bacteriological department, and after the death of the city bacteriologist, the work was carried on by arrangement with the Provincial Board of Health. It is stated, however, that the province will soon desist from this branch of work. This will probably entail the appointment of a city bacteriologist as the analysis would have to be carried on under supervision.

Sacred Heart Hospital

The Sacred Heart Hospital on Gouin Boulevard for the treatment of tubercular patients and incurables, a magnificent new structure costing in the neighbourhood of $3,000,000 was opened by His Grace Archbishop Gauthier. The new hospital is of Lombardic style. The four present wings will accommodate 575 patients and four more will shortly be added. The building is five storeys high, mostly of concrete and entirely fireproof. There are at present 360 patients. The staff of the hospital includes, Dr. Gendreau, director; Dr. L. de L. Harwood, Dr. Lesage, G. Baril, Dr. L. Jutras. There are three nurses and two assistant nurses on the staff of the institute. Dr. Oscar Archambault is treasurer. Dr. G. Baril is secretary and Dr. Joseph Gavreau is assistant secretary-treasurer.

Dr. George Vincent, president of the Rockefeller Institute will visit Montreal on December 3rd. He will be chief speaker at the annual meeting of the Canadian National Committee for Mental Hygiene, which is to be held at the Ritz-Carlton Hotel in the afternoon of that day. Dr. Vincent will take as his subject, "Public health and mental hygiene."

A bequest of $200,000 to the Montreal General Hospital, is contained in the will of the late Col. George R. Hooper of Montreal, who died on August 23rd, which has just been made public. Another large amount is left to the endowment fund of Bishop's College University, Lennoxville, of which the deceased had been a director. This bequest is $100,000. McGill University also benefits by terms of the will, one quarter of the residue, approximately $100,000, being the allotment fixed. Colonel Hooper had always been greatly interested in hospital and educational work. He was active in connection with the organization of the Emergency Typhoid Hospital in Montreal and until a short time before his death had been president of the Canadian Society for the Prevention of Cruelty to Animals.

The newly completed special gifts committee of the Hospital Francais campaign meets for its first executive session to discuss the ways and means of raising its quota of the $250,000 sought by the hospital for its expansion programme. Sir Lomer Gouin and Mgr. Deschamps are scheduled to speak.

The first meeting of the new auxiliary board of the Royal Victoria Montreal Maternity Hospital held in the hospital, was marked by the appointment of a new committee, headed by Lady Meredith, which will render social service to patients. Dr. W. W. Chipman set forth the duties of the new committee, which will render social service to include the provision of layettes for poor babies; the emergency fund for taxis and loan of cars; the district service bags and provision of furniture and plants for the sun rooms. The meeting was opened by the chairman, Sir Vincent Meredith, Bart., who expressed his pleasure at the large number of friends of the hospital present, which he said was an evidence of the great interest they took in the hospital and of their willingness to help in every way in making the institution the success he knew it was going to be.

On October 27th there occurred in Montreal the death of Mr. Henry E. Webster, Superintendent of the Royal Victoria Hospital. Born in England, Mr. Webster came to Canada in his early twenties, and almost immediately started his career with that institution which he was to serve faithfully for over thirty years. His work was his life and he gave to it generously of his time and strength. His devotion to the hospital, his ability as a superintendent and his administrative and financial powers were alike unquestioned. He had great pride in the growth of

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the hospital, and had no small part in its development. Among hospital superintendents all over this continent, he was well known, and took a prominent part at the meetings of their association. The Royal Victoria Hospital will feel his loss keenly.

Dr. E. W. Archibald, professor of surgery, McGill University, Montreal, has been elected an honorary fellow of the New York Academy of Medicine. Although the academy, which dates back to 1847, is composed of 2,000 ordinary fellows only eighteen of its members are honorary fellows and all are men of great distinction.

Dr. C. F. Martin, dean of the faculty of medicine, McGill, University has been elected President of the Association of American Medical Colleges. The association numbers over seventy medical schools in its membership (only three of which are Canadian.) Every school sends its dean, assistant dean and secretary to the annual meetings. The next meeting will take place in Montreal in October, 1927.

Clinical evenings have been started for the coming session in the Children's Memorial Hospital. The first was held on the November 26th. The programme included reports on "A case of depressed fracture of skull" by Dr. H. Rupert Derome; "A case of intracranial hæmorrhage" by Dr. Alton Goldbloom; "Subacute bacterial endocarditis" by Dr. H. B. Cushing; "Pathological specimens of bacterial endocarditis" by Dr. C. L. Connor; "A method of treatment of spina bifida" by Dr. A. Mackenzie Forbes; and "Two cases of rickets with multiple fractures" by Dr. Lionel M. Lindsay. Dr. Finley acted as Chairman.

ONTARIO

A meeting of the Wellington and North Halton Medical Society was held on Wednesday evening, September 29, 1926, in the Lecture Hall of "The Homewood Sanitarium", Guelph. The President, Dr. H. H. Argue, Mount Forest, occupied the chair. Thirty-nine members were in attendance. This meeting presented somewhat of an innovation, in that the members of the North Waterloo Medical Society were invited to come over and present the programme for the evening. Members from Kitchener and Waterloo accepted the invitation and the following interesting papers were read and discussed. "The genito urinary tract," Dr. Harvey, Kitchener. "Experiences on the Amazon," Dr. Shields, Kitchener. "Some life insurance problems," Dr. Honsberger, Kitchener. Short addresses were also given by Dr. J. M. Livingstone, President of the Waterloo Society and by Dr. Ward Woolner, district representative of the Ontario Medical Association. Dr. Harvey Clare, superintendent of the Homewood Asylum and his staff entertained the Society for the balance of the evening.

The Ontario Neuro-Psychiatric Association held its annual meeting in Toronto on October 6th. The meeting was given over to the discussion of neuro-syphilis. Dr. G. H. Kirby, Director of the Psychiatric Institute of New York City was an interested visitor and addressed the meeting upon the subject of "The treatment of neuro-syphilis with special reference to the use of tryparsamide" and upon "Malarial therapy of general paresis."

At the special meeting of the Toronto Academy of Medicine on October 22nd, Dr. W. Sampson Handley of the Middlesex Hospital of London, England, spoke upon the treatment of moles and melanotic growths, and Prof. D. P. D. Wilkie of the University of Edinburgh discussed the pathological conditions affecting the large bowel in the cæcal area. On October 12th, the profession had put before them by Drs. Bryan and Magner the clinical and pathological findings in caisson disease, cases of which have been appearing in the hospital in the last few months as the result of the failure of the workers to realize that decompression by degrees was necessary even in such a commonplace undertaking as sewer construction. In the big sewer being constructed in North Toronto a depth has been reached at which the atmospheric pressure is such that the symptoms of this affection develop unless the workers are carefully guarded in their coming and going. There have been upwards of twenty cases so far reported.

The Councillor District No. 5 of the Ontario Medical Association met in Toronto on October 20th, at the Academy of Medicine. The following interesting clinical programme was provided. After the greetings of the President, Dr. Edgar Brandon, and the Secretary of the Ontario Medical Association, a demonstration of clinical cases took place. Dr. H. B. Anderson presented a case of Froehlich's syndrome, and a case of argyria; Dr. Harold Harrison a case of splenomegaly. A case illustrating the results of the treatment of nævi by radium was shown by Dr. F. C. Harrison. Afterwards the following papers were read: "The tannic acid treatment of burns," by Dr. R. I. Harris; Hæmorrhagica purpura of thrombotic origin," by Dr. Geo. E. Smith; "Tumour of the mouth—differential diagnosis," by Dr. E. J. Trow; "Pernicious anæmia —A new dietetic treatment," by Dr. H. C. Wales. Moving picture films demonstrating the setting of fractures were given by Dr. G. E. Wilson. At the close of the meeting afternoon tea was served.

Dr. A. J. Grant addressed the Harvey Club of London at its last meeting on October 30th taking as his subject "Sub-deltoid bursitis."

The regular meeting of the Academy of Medicine scheduled for the evening of November 10th took the form of a clinical evening at the Western Hospital. An excellent programme presenting many phases of general medicine was provided for the large gathering which assembled.

The plans for the new hospital in Toronto East are now being completed in the office of the city architect; building operations will commence next year and a board of governors has already been chosen consisting of men prominent in the eastern portion of the city.

MANITOBA

Dr. J. E. Pritchard who for a number of years has been Assistant Superintendent of the Manitoba Sanatorium at Ninette, has severed his connection for the time being with that institution and is assisting Dr. Wm. Boyd in the Department of Pathology, Winnipeg General Hospital. Prior to his departure

he was presented by the staff of the Sanatorium and by the Ninette community with a fine binocular microscope.

A memorial tablet to the late Dr. Gordon Bell was unveiled on Nov. 12th, at the new Gordon Bell Junior High School. Dr. E. W. Montgomery, Professor of Medicine, University of Manitoba and for many years a class friend of the late Professor of Bacteriology, gave an eloquent address on the character and ideals of the beloved physician.

Dr. D. F. McRae recently underwent a serious operation for abdominal tuberculosis and is now convalescing at the Sanatorium.

Throughout this winter a series of radio talks on medical and dental subjects will be given under the auspices of the Manitoba Medical Association and the Winnipeg Dental Association from station C.K.Y.-Winnipeg.

Drs. B. J. Brandson, D. S. MacKay and D. Nicholson recently made a tour of the principal medical centres in British Columbia under the extra-mural post-graduate scheme of the Canadian Medical Association. Dr. A. A. Murray and Ross Mitchell have visited the leading points in Saskatchewan, and Drs. J. E. Lehmann and Hugh MacKay the chief places in Alberta on similar missions.

A brief but impressive service was held at the new building of the Manitoba Medical College on Armistice Day. Dr. D. J. Brandson, President of the Manitoba Medical Alumni Association, deposited a wreath before the memorial tablet to those doctors and students who had fallen in the Empire's wars and Jos. T. Thorson, M.P., Dean of the law school gave an address.

ROSS MITCHELL

SASKATCHEWAN

The regular monthly meeting of the Regina and District Medical Society was held Wednesday, November 3rd, in the Parliament Buildings following a banquet in the restaurant. Some forty-five members were present and the following programme was presented.

Dr. Gorrell gave a very enlightening paper on "Trachoma." The discussion was lead by Drs. Palmer and Hardy. A very interesting paper by Dr. R. O. Davidson of the Public Health Department on "The serum treatment of scarlet fever and diphtheria." An interesting clinical case was presented by Dr. W. A. Harvie of a shoulder joint condition.

Dr. R. G. Alexander who formerly practised in Saskatoon, is now at Arrowwood, Alta.

Dr. T. G. McCartney has opened an office at Bienfait, Sask.

Dr. G. J. Whetham, who formerly practised at Weyburn for a number of years, has moved to Moose Jaw.

The following recent graduates, have opened offices in the province: Dr. Wm. Setka, Perdue; Dr. E. L. Moyer, Moose Jaw; Dr. E. G. Douglas, Glenavon; Dr. A. R. Coulter, Elrose; Dr. W. A. Kirkpatrick, Lacadena; Dr. J. A. McDonald, Cudworth.

Dr. S. E. Burnham, who practised at East End, is on an extended visit to Glendale, California.

Dr. John Orr, formerly of Winnipeg, has joined the staff of the Sanatorium at Saskatoon.

Dr. S. W. Bond, who for some time practised at Beechy, is now assisting Dr. H. E. Alexander of Saskatoon.

The by-law for the $200,000.00 new wing to the General Hospital has been approved by Council and will come up at the civic elections in December. Considerable work has been done on propaganda and the feeling is that the by-law will pass readily.

Dr. W. A. Dakin has returned to Regina after a month spent in the east.

Dr. George Currie has returned to his practice in Regina with his bride from Toronto.

R. MCALLISTER

ALBERTA

PRESENTATION OF OIL PAINTING OF THE HON. R. G. BRETT, M.D., TO LIBRARY OF THE UNIVERSITY OF ALBERTA, SEPT. 9, 1926

The following address was delivered by Dr. F. H. Mewburn, on behalf of the College of Physicians and Surgeons, the occasion being the presentation of a life-sized oil painting of the Hon. R. G. Brett, M.D., ex-Lieut.-Governor of the Province of Alberta. His Honour Lieut.-Gov. Egbert, M.D., presided, Dr. W. D. Ferris representing Dr. Brett, who was absent in California, expressed thanks, and Chief Justice Harvey, received the portrait on behalf of the University and stated that it would be placed in the Library of the Medical Building.

Your Honour: "It is my privilege on behalf of the medical profession of this province, to present to ynu this portrait in oil, of Robert George Brett, distinguished not only in his profession but also as a legislator, and identified with the growth and development of this western country for the last forty-six years.

Robert George Brett was born in Strathroy, Nov. 16, 1851. His primary education was obtained at the local grammar school from which he passed on to the University of Toronto, and graduated in medicine from Victoria University, Cobourg, in 1874. He took post-graduate work in New York and Philadelphia in 1876, and later in Vienna in 1896. He practiced in Arkona, Ontario, for some years, and afterwards in Winnipeg in 1880. The Register of the College of Physicians and Surgeons of the North-West Territories shows Brett's name as thirty-fifth on its roll under date of 1888. In

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1889 he was elected to the council, and became its president in 1891.

It was in 1882 that I first met Dr. Brett; he was one of a remarkable group of medical men for as new a city as Winnipeg to have; a group headed by Lynch, and including Blanchard, Kerr, Good, Jones, Hugh A. Ferguson, R. B. Ferguson, McDermid, Gray, Whiteford and others; Chown and Higginson came later. He was one of the founders of the Manitoba Medical College, filling the chair of materia medica and therapeutics.

It was about 1884 that in company with Dr. Orton he took medical charge of the construction work of the Canadian Pacific Railway, then being rapidly pushed across the prairies and into the mountains. His association with Banff began with these duties, but he enjoyed its mountain air and scenery and in 1886 he established the Banff Sanitarium and later the Brett Hospital.

He was elected a member of the Dominion Medical Council in 1912, and became its president in 1921; he was appointed a Senator of the University of Alberta in 1908 and was re-elected in 1912, and in 1915 was appointed Lieutenant-Governor of the province, holding office for ten years, and gracing the position as to the manner born. During his term of office, amongst his many duties, he was indefatigable in furthering the work of the Red Cross Society; and ever took an active part in the military life of the country, being an Assistant Surgeon of the old 90th Regiment of Winnipeg, and Hon. Colonel of the 82nd Battalion, C.E.F.

He introduced medical regulations into the North-West Assembly, creating the first Medical Act, establishing the College of Physicians and Surgeons of the North-West Territories, and from that time on for years he was at all times on guard against the licensing of patent doctors. There is no doubt that the action of Alberta, initiated by Brett was responsible for the Roddick Bill and the Dominion Medical Council. That bill had as its basis the federation of the four western provinces, controlling absolutely medical education in the provinces and fixing a standard for those medical men coming in from outside. This action removed the opposition of Quebec and Ontario and the Roddick Bill became law.

Of his other activities in the legislature, I will not speak except to say that Dr. Brett always stood for good government, and wider powers for the Assembly. His name goes down in history as having had a very important part in the establishment of responsible government in the North-West Territories, and sharing that honour with such men as Haultain, Ross and Oliver.

This ceremony is unique in the history of medicine of this western country. This is the first time in its history, that a portrait has been presented to one of its members. It places our confrère alongside of Frank J. Shepherd of Montreal and Colonel A. H. Cameron of Toronto. Truly the young west had its able representatives, as well as the learned old east.

In conclusion, in the name of the profession, I ask your acceptance of this portrait, and the profession request that you make such disposition of it, that it may always be an incentive to the present and coming men, and stand as a monument of work done and deeds accomplished by a man who above everything else was a gentleman."

Dr. Ferris on behalf of the Hon. Dr. Brett received the portrait and presented it to the University with the following remarks:

"In the absence of the Hon. Dr. Brett I accept this oil painting from the College of Physicians and Surgeons of Alberta, and on his behalf I wish to thank the medical profession of the Province of Alberta for the kindly feelings which actuated the gift. Dr. Brett in a recent letter asking me to reply this afternoon for him in his absence, stated that he did not know exactly why he should be the subject of this demonstration. He was not aware of any great deed done by him to merit such recognition, but he could only say that at all times he had done the best in his power to advance and safeguard the profession that we all love so well." Dr. Ferris then referred to the distinguished band of practitioners, "old timers" who in the past had guided the profession scattered throughout this sparsely inhabited north-west province. In addition to the Hon. Dr. Brett the band was composed of Mewburn of Lethbridge, Bain of Prince Albert, Cotton of Battleford, Rouleau, Lafferty and Mackid of Calgary, Kennedy and Edwards of Macleod, McInnis, Braithwaite and Wilson of Edmonton. These grand old men of the profession were characterized by the wonderful manner in which they upheld the honour, dignity and traditions of the noble profession to which they felt it an honour to belong. "On behalf of our beloved and honoured friend I thank you most reverently and sincerely."

On receiving the portrait of Dr. R. G. Brett, on behalf of the University of Alberta, the Hon. Mr. Justice Harvey spoke as follows:

"It gives me much pleasure on behalf of the University of Alberta to accept this portrait as a memorial of one of Alberta's most eminent physicians and distinguished citizens; a portrait which may serve as an incentive to high endeavour to the young men, who from year to year will pass through these halls.

When I came to Alberta more than thirty years ago, Dr. Brett was already one of the most outstanding members of the medical fraternity of the west, and also one of its most prominent public political figures. As Col. Mewburn has said, he was elected to the first Legislative Assembly of the North-West Territories, nearly forty years ago, and was one of its leading members. These were strenuous and often difficult years in the Assembly, during which it directed the development of responsible government in the territory that now constitutes the two provinces, Alberta and Saskatchewan. It was appropriate that a member of the medical profession should take such a prominent part in the growth to full maturity of such a well organized government as we now enjoy.

It was my privilege, as Chief Justice, to administer the Oath of Office to him, both on his original appointment and five years later on his re-appointment, which fact gives me an added pleasure in having a small part, in another capacity, in this ceremony to-day.

As Governor, Dr. Brett, was the visitor of the University, and always took a great interest in all its activities, and particularly in its medical faculty, and was, as you have been told, a member of its first Senate. The University is proud to have his name on its roll of Honorary Graduates, with those of the Prince of Wales and many other prominent and distinguished persons.

The University considers itself honoured and feels proud to be made custodian and possessor of the portrait of one so eminent in his profession, so distinguished in his public service, so popular as a governor, and so well beloved as a man and citizen, and with it all, one of the University's best friends."

At the regular monthly meeting of the Calgary Medical Society, held on November 2nd, Dr. John Palmer discussed the subject of "Chronic prostatic hypertrophy" from the view point of the specialist in a very lucid and instructive way. A good discussion took place concerning some of the points which he had raised.

The third of the series of extra-mural post-graduate lectures and clinics was given to the physicians of Alberta, between November 8th and 16th, by Dr. J. E. Lehmann, M.R.C.S., F.A.C.S., Associate Professor of Clinical Surgery in the University of Manitoba, and Dr. Hugh McKay, F.A. C. P., Lecturer in Dermatology, in the University of Manitoba. The following towns and cities were visited: Medicine Hat, Lethbridge, Calgary,

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In Calgary lectures and clinics were given on November 10th. The meetings were well attended and the lecturers held the attention of the physicians throughout the courses nd excellent instruction was given.

Dr. McKay conducted a clinic on disease of the skin at the General Hospital in the morning where a number of patients were presented. Diagnosis and treatment was given to those affected with one of the following lesions: chronic furunculosis, eczema, tertiary luetic skin manifestations, plant dermatitis, varicose veins of the leg engrafted on an old burn, lupus erythematosus, rodent ulcer, acne vulgaris. In the evening Dr. McKay gave a lecture on the history of the discovery of radium and of its therapeutic application in various organic lesions, chiefly of a malignant nature, in which its use is specially indicated. Numerous lantern slides were shown, illustrating the discovery and therapeusis of this valuable agent.

Professor Lehmann followed Dr. McKay with a very illuminating discussion on the physiology of the large bowel and the effect of unsuitable dietaries on its functions. Aberrations from the normal, due to these latter causes were graphically shown by numerous lantern slides of x-ray examinations through the media of barium sulphate enema. Professor Lehmann placed particular emphasis on the unsuitability of many of our present day foods, especially the prepared breakfast compositions, which in his opinion were responsible for much of the dysfunctional disturbances in the colon, as well as for the production of simple colitis.

Professor Lehmann's second lecture was of particular interest, since it had to do with his personal experiences in the treatment of fractures of the bones of the hand and arm and leg, as well as of the pelvis and certain fractures of the bony vault of the cranium. Methods of handling fractures were thoroughly discussed and were of much value to those who listened to this able discourse. Many slides illustrating radiographs of the fractures under discussion were shown.

Co-operation between the physicians of this province and the Registered Chemists will be greatly advanced if the plans under consideration materialize. The Alberta Medical Council and the Council of the Registered Chemists will meet next year to discuss items of common interest. There is apparently no reason why misunderstandings should occur, though we do not hesitate to say that "counter prescribing" by a druggist should be prohibited.

Dr. N. J. Minnish, formerly of the staff of the University of Alberta, is now assistant to Dr. R. L. Borden at Coleman.

Dr. Joseph Jackson of Cadomin, has left the province to accept a position on the staff of the Medical Department of the University of Alberta.

The many friends of Dr. G. A. Byers of Eckville, will regret to learn of the serious illness of Mrs. Byers, while on a visit to her former home in Omaha, Nebraska, where Dr. Byers was hastily summoned.

Dr. T. M. Palmer, formerly of Claresholm, is now in practice at Morrin, in the Drumheller district.

Dr. A. E. B. Denovan, who has been practising in St. Paul, Alberta, for some time, has returned to Drumheller where he previously practised.

Dr. J. H. Hardy has moved from Brosseau to the Peace River district.

According to Mr. W. G. Hunt, Associate Secretary of the Alberta Medical Association, there are still many openings for men who are willing to take up country practice where they can render real service to the pioneer settlers and where the lack of hospital facilities will not be a deterrant. Several Alberta physicians who are contemplaitng post-graduate work have their property for sale, therefore a good practice may be obtained by a physician willing and able to purchase the property, which in each instance is in well established towns. The Registrar of the College of Physicians and Surgeons at Calgary will give the desired information.

BRITISH COLUMBIA

Owing to the large territory covered by the old Kootenay District Medical Society, a branch of the British Columbia Medical Association, it was recently decided to divide the district into two local societies. The first meeting of the East Kootenay Society was held at Cranbrook on Saturday September 25th, when the following officers were elected: Dr. Douglas Corsan, Fernie, President; Dr. G. E. L. MacKinnon, Cranbrook, Vice-President; Dr. B. Asselstine, Fernie, Secretary-Treasurer; Dr. Douglas Corsan, Fernie, Representative on Executive Committee, B.C. Medical Association. Dr. F. W. Green, Cranbrook, Dr. M. E. Tiffin, Kimberley and Dr. F. E. Coy, Invermere were elected members of Local Executive.

The West Kootenay District Medical Society held its first meeting at Nelson on September 27th, when the election of the following officers took place: Dr. J. Bain Thom, Trail, President; Dr. W. A. Truax, Grand Forks, Vice-President; Dr. C. S. Williams, Trail, Secretary-Treasurer; Dr. J. Bain Thom, Representative Executive Committee, B.C. Medical Association. Dr. A. Francis, Greenwood, Dr. D. J. Barclay, Kaslo, and Dr. W. O. Rose, Nelson, were elected members of Local Executive.

The recent extra-mural post-graduate tour through the province of British Columbia, held under the auspices of the Canadian Medical and B.C. Medical Associations, and made possible through the generosity of the Sun Life Assurance Company, proved a decided success. One cannot speak too highly of the three distinguished Winnipeg doctors selected for the tour: Dr. B. J. Brandson, Professor of Surgery, Dr. D. S. MacKay, Professor of Gynæcology, and Dr. Daniel Nicholson, Assistant Professor of Pathology, all of the University of Manitoba. They were excellent in every way; able and convincing speakers, practical as teachers, untiring in their efforts to impart knowledge of their respective subjects and answer the numerous questions which followed each paper; ever ready to attend the hospitals and give valuable help to the local doctors in difficult cases, and to hold clinics on the same. They have left behind them a strong feeling among the local men that out of the 150 doctors who have been engaged in this work during the past year the speakers from Manitoba were surely among the best. It is pleasing to note that thirty-seven new members joined the Canadian Medical Association on this tour.

Whilst lectures and clinics were given in nine towns, as per itinerary, five additional towns were visited en

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route and cases were seen in hospitals at the request of local doctors. The following are two instances: on the way from Vancouver to Prince Rupert the visiting doctors, at the request of the doctor at Ocean Falls, saw a difficult case in his hospital, a courtesy which was much appreciated. Again, whilst travelling from Prince Rupert to Prince George, the Canadian National Railway Co., held the train back at Smithers an extra ten minutes whilst the doctors visited the hospital and diagnosed a case which had been puzzling the local doctor. Dr. Hankinson, the local doctor, expressed his appreciation of this courtesy in no measured terms. The attendance at the respective meetings was excellent, in some cases 100 per cent of the local members, the only absentees being those men who found it impossible to leave their practices. British Columbia is a province of magnificent distances and it is worth noting that, at Cranbrook, one man motored 102 miles each way, another eighty-six miles, one sixty-eight miles and three men sixty-three miles. For the Nelson meeting one man came 150 miles, another 125 miles, whilst other men motored over fifty miles each way. At Kamloops the men came from places ranging from forty to 150 miles away, and similar long distances were travelled by the men in the remainder of the districts.

In Vancouver a luncheon was given by the British Columbia Association in honour of the visitors, when Dr. B. J. Brandson gave an inspiring address on "Professional optimism" to a large attendance of local medical men. Whilst the tour was intensive owing to the long distances to be covered, our visitors were compensated by the wholehearted enthusiasm of those who were privileged to hear them. It is gratifying to note that the Sun Life Assurance Company has given another $30,000 for the continuance of this post-graduate work and arrangements are now in hand for another tour in the early part of 1927.

That there has been no abatement in the activities of the British Columbia Medical Association during the past summer months is evidenced by the steady stream of mail, which flows daily into the business office, and now that the winter months are with us the committees will be taxed with the many matters of an economic nature which come up from time to time, whilst the Association's committees are actively engaged in solving various problems that have been referred to them.

It is gratifying to note that there are eleven new members for election at the next executive meeting.

Victoria Medical Association

At the annual meeting of the Victoria Medical Society the election of officers placed Dr. Thomas McPherson as president; Dr. M. W. Thomas, as vice-president, and Dr. R. L. Miller, as honorary secretary-treasurer.

The retiring president, Dr. J. W. Lennox, reviewed the year's work, and referred to the splendid support the profession had accorded the executive during the Canadian Medical Association convention in June.

There was a full attendance at the addresses given at the post-graduate lectures in Victoria, and the addresses were much appreciated.

Dr. Forrest Leeder, the chairman of the library committee, reported progress in the development of the Medical Library, which has grown during the past four years to very healthful proportions and has proved a valuable adjunct to the work of the members.

We are pleased indeed to report that Dr. J. H. MacDermot, President of the British Columbia Medical Association, has sufficiently recovered from his long illness to return home from hospital, and it is hoped that he will be able to resume practice before very long.

Dr. Neil MacNeill has left on an extended trip to Europe, via the Panama and Egypt. He expects to spend the winter in Vienna in post-graduate work, and afterwards will proceed to London and Paris, returning to Vancouver in the spring.

The first meeting of the winter session of the Vancouver Medical Association was held on October 5th, at which the President, Dr. A. W. Hunter delivered his presidential address on the value of group sickness and automobile insurance for medical men.

A member of the Vancouver Medical Association with a few friends went for a week end trip up the coast and came back with four deer and four goats. A good return for a short holiday which did not interfere with practice.

At the general meeting of the Vancouver Medical Association on November 2nd, Drs. H. W. Hill, A. Y. McNair and W. J. S. Millar were elected to membership.

The November number of the *Bulletin of the Vancouver Medical Association* contains an interesting account by Dr. Malcolm T. McEachern of his recent visit to Australia and New Zealand for hospital standardization purposes.

Dr. Wm. Sager has relinquished his practice at Port Simpson and is now at Port Coquitlan. His practice has been taken over by R. G. Large who has for some time been assisting Dr. Wrinch at Hazelton.

UNITED STATES

Johns Hopkins School of Hygiene

The new building of the School of Hygiene and Public Health of the Johns Hopkins University was formally opened last month and is an imposing, fire-proof structure. It will house the departments of bacteriology, immunology, chemical hygiene, physiological hygiene, epidemiology, vital statistics, and public health administration.

Down to 1914 the teaching of public health in the United States was mainly carried on by the Massachusetts Institute of Technology, and by various courses in medical schools. That year a conference of leading authorities was held to consider the question of the training of public health officials. At the request of the conference a plan was prepared for an Institute of Public Health, following on which the Rockefeller Foundation decided in favour of setting up such an institution at the Johns Hopkins University, and in June 1916 the Foundation informed the university that it was prepared to co-operate in the establishment of a School of Hygiene and Public Health. The University accepted the offer and its board of trustees appointed Dr. W. H. Welch as director. The school began its work in 1918; the new buildings were completed in 1925, and the ceremonial opening took place recently.

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American Medical Colleges held in Cleveland, October 25-27, Dr. Charles F. Martin, dean of the faculty of medicine of McGill University, was elected president for the ensuing year. Dr. E. S. Ryerson, of the faculty of medicine of Toronto University, was appointed on Committee on Education Medical and Pedagogics. The meeting in 1927 will be held in Montreal, October 24th and 25th.

Dr. William B. Porter, now chief of the department of medicine Lewis-Gale Hospital, Roanoka, Virginia, has been elected whole-time professor of medicine at the Medical College of Virginia, Richmond. Next summer after studying medical educational procedures in leading American and European universities during the coming winter and spring, Doctor Porter will take up his active work at the College.

Announcement is made in our columns of the Eleventh Annual Clinical Session of The American College of Physicians to be held in Cleveland, Ohio, February 21 to 25, 1927. A programme of unusual interest is being planned in which the Cleveland hospitals and the Western Reserve University will co-operate.

During the mornings there will be clinics and demonstrations at the various hospitals and in the laboratories of the Western Reserve University; during the afternoons papers on various medical topics will be delivered by local members of the profession and by members of the College from other parts of the United States and from Canada; during the evenings there will be formal addresses by distinguished guests, American or foreign.

The American College of Physicians is an organization in which Internists may find a common meeting ground for discussion of the special problems that concern them and through which the interests of internal medicine may have proper representation. The College extends an invitation to all qualified physicians and laboratory workers to attend its session.

Book Reviews

Practice of Physiotherapy. C. M. Sampson, M.D., formerly of the Physiotherapy service Walter Reed U.S. Army, General Hospital, Washington, D.C. 114 illustrations, 620 pages, price $9.50. The C. V. Mosby Company, Publishers, St. Louis, Canadian Agent, McAinsh & Company, Toronto.

This book is based on years of study with intensive work in the reconstruction clinics of the American Army. A comparison of this volume with Physiotherapy Technic by the same author published about three years ago demonstrates the rapid strides this branch of therapy has made with the medical profession. After an opportunity of reading this volume one cannot but be convinced of the real value of physiotherapy in the armamentarium of the present day physician.

The volume is divided into two parts, the first dealing with the physics and technique of the subject The second deals with the clinical application of the various physio-therapeutic organs. In the section on physics and technique the author has presented an enormous amount of very valuable information. Any attempt to acquire the same volume of matter from other sources dealing with the various physical agents would entail a vast amount of reading and the use of much valuable time.

In the chapter on diathermia, the author has gone into the subject very exhaustively. The different methods of its use are handled in an illuminating manner. The selection of the type of treatment for the individual case is so well described that little is left to add. The contra-indications for the use of diathermia are also very well elucidated. This is probably as great value as the former.

The portion of the work given over to quartz lamp therapy is very well written. It is doubly interesting on account of the increasing use of this agent in the therapeutic field. The physics of quartz light is described very thoroughly, and in a manner that it may be understood by one not acquainted with the subject. The technic used by the author is given very concisely as applied to many conditions, thus leaving slight chance for error if closely studied. Included in the section are several chapters on the prevention of x-ray burns, and the treatment of acute and chronic x-ray burns by the quartz light. A study of these chapters will well repay anyone interested in x-ray therapy, and acqainted with the results of a burn.

The galvanic, paradic, and galvanic sinusoidal currents receive full consideration in the physics section, with a lucid description of their applications. The chapters on massage and hydrotherapy conclude the first part of the volume. While these two subjects do not receive the detailed treatment given to other subjects included under physiotherapy much valuable information is introduced.

The second section of the volume is given over to the clinical application of the various therapeutic agents. In this section many diseases are enumerated, and a detailed statement of the application of the different methods of treatment of the disease is given. While it is true many of the diseases cited do respond splendidly under physiotherapy, one surely would have to be an enthusiast to accept all the claims put forward.

The literary style of the author is not what one usually expects in a scientific work. The enormous amount of valuable information contained in his book could have been imparted with more moderate use of the English language. The use of invective and low comedy adds no force to the argument for, but rather lessens the probability of accepting already proven statements.

The volume is a much needed addition to the meagre information on the subject, and will be found valuable to the general practitioner in the information it supplies on the application of physiotherapy to his every day problems. W. H. DICKSON

Visual Field Studies. Ralph I. Lloyd, M.D., F.A.C.S. 216 pages, 124 illustrations. Price $6.00 net. E. C. Sweney Co., Manhatten, N.Y., 1926.

As the author states in his introduction, this book is the presentation in print of material originally prepared for post-graduate instruction. He has succeeded to a marked degree in attracting and holding the interest of the reader, and one cannot peruse its pages without having his faith (sometimes faltering) strengthened in the value of carefully carried out visual field studies. The sections on retinal physiology, strabismus, and glaucoma have appealed to the reviewer as being particularly good—if one can discriminate in a work which contains so much that is worth while. In every way the book may be considered a valuable contribution to ophthalmic literature and will do much to stimulate interest in this branch of ophthalmic study. W. A. SCANLON

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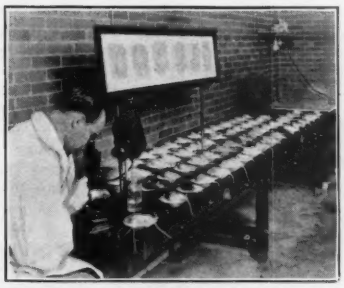

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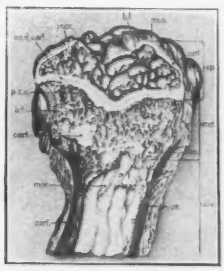

The Microscope reveals healed Rickets if the oil is potent

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Cavernous Sinus Thrombophlebitis and Allied Septic and Traumatic Lesions of the Basal Venous Sinuses. Wells P. Eagleton, M.D., Medical Director, Newark Eye and Ear Infirmary, Newark, N.J., etc. 196 pages. Illustrated. The Macmillan Company of Canada Ltd., Toronto, 1926.

This book is based upon a clinical study of twenty-five cases of cavernous sinus thrombosis, twenty-one of whom died (eleven autopsies). There were four recoveries, three of which were verified by operation.

In the introduction it is pointed out that a large proportion of the cases of meningitis and brain abscess from nasal and aural suppuration are due to a retrograde thrombophlebitis and often follow a well conducted operation, and for this reason a thorough knowledge should be had of the suppurative lesions of the venous system. The point is stressed that there are many types of cavernous sinus thrombosis, and that the classical symptoms depend upon the suddenness of onset and are only met with in acute cases.

The first classification is based upon the suddenness or gradualness of onset. The cases are then classified into six groups according to the route of infection and a chapter is devoted to the consideration of each group. There is also a pathological classification.

The diagnosis is fully considered, and the treatment outlined is most thorough, and is based upon a consideration of the surgical pathology, anatomy, embryology, and physiology of the parts involved.

Special mention should be made of the complete list of cases excerpted from the literature and which are carefully classified in this monograph.

W. J. McNALLY

Goitre and Other Diseases of the Thyroid Gland. Arnold S. Jackson, M.D., Jackson Clinic, Madison, Wis. Price $10.00. 401 pages with 151 illustrations. Paul B. Hoeber, Inc., 67-69 East 59th Street, New York City, 1926.

When an author presents a subject such as "Goitre and other Diseases of the Thyroid Gland" in a goodly-sized volume of 400 pages, well printed and bound and excellently illustrated, one feels that he must have something distinctive to contribute to this subject.

Dr. Arnold S. Jackson brings to his undertaking a knowledge of the thyroid gland gained by three years' work and study at the Mayo Clinic under such men as Plummer, Pemberton, Boothby, MacCarthy, Wilson and others, and subsequently several years' surgical experience and study of thyroid diseases in connection with the Jackson Clinic, Madison, Wis., from which Dr. Jackson's contributions to the literature of the thyroid in the past have been numerous and valuable.

The author gives us very clearcut views on every phase of thyroid disease. In the introduction he tells us that "one of the main objects of the book is to break down the old, old theory that goitre of youth is merely a physiological enlargement of the gland, which in time would be spontaneously cured."

The anatomy, physiology and biological chemistry of the thyroid is briefly reviewed in one chapter and the relation of the thyroid to other ductless glands in another. The etiological factors of goitre are well considered. Dr. Jackson agrees with the leading authorities on this continent that it is an iodine deficiency disease.

The chapter on "The classification, symptomatology and diagnosis" is, from the clinician's standpoint, the most important in the book. In this chapter a simple classification is followed and an accurate description of the symptoms and differential diagnosis is given. Dr. Jackson's experience with iodine hyperthyroidism enables him to write with emphasis on this form of thyroid trouble. A helpful table for differential diagnosis is included.

The subjects of malignancy and inflammations are dealt with in chapter VII, and the diagnosis and treatment of myxœdema and cretinism in chapter VIII. As to the use of iodine in thyroid disease the author holds very definite views and a chapter is given up to this subject.

There are chapters on the pathology of the gland and on the medical treatment of goitre, which includes a discussion of the "surgical vs. the medical treatment." A large portion of the book has to do with the surgery of goitre. Dr. Jackson stresses the importance of careful pre-operative examination and treatment by an internist and close co-operation with him in the post-operative care. His work proves once again that the best results in thyroid surgery are achieved by the surgeon who specializes in that branch.

A comprehensive bibliography and good index complete this excellent volume, which should be read by all interested in the subject of thyroid diseases.

W. D. KEITH

The Modern Treatment of Hæmorrhoids. Joseph Franklin Montague, M.D., F.A.C.S. Of the Rectal Clinic, University and Bellevue Hospital Medical College. Foreword by Harlow Brooks, F.A.C.P. Price $6.00. 296 pages with 116 illustrations. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1926.

This work, written by an expert proctologist, is confined to a most complete discussion of hæmorrhoids. The signs, symptoms and pathology are dealt with in an absorbing and efficient manner, making excellent reading. Classification is simply and effectively presented. Diagnosis is well discussed in all detail.

Procedures of examination are well presented, the most minute detail being thoroughly explained, so that one unaccustomed to such work should derive a great deal of knowledge concerning examination of rectal cases. Treatment is well explained and the type of case for each method of treatment is thoroughly considered. Operative and injection technique is fully explained as is also radium and electrical procedures. The complications are dealt with exhaustively.

In all this book is well worth perusal and should be an excellent reference in all rectal cases.

A. B. MALCOLM

The Surgical Treatment of Goitre. Willard Bartlett, A.B., A.M., M.D., D.Sc., F.A.C.S., St. Louis, with Foreword by Dr. Charles H. Mayo, Rochester, Minn. Price $8.50. 365 pages with 130 illustrations. The C. V. Mosby Co., St. Louis. Canadian Agent; McAinsh & Co. Ltd., Toronto, 1926.

The demand for a comprehensive work on the surgical treatment of goitre has existed and this volume has covered this field very thoroughly. As the name implies the broad field of goitre in its other phases, particularly that of differential diagnosis is not dealt with. The writer has left the question of non-surgical goitres and what types fall into this group for other authors and has by so doing avoided many of the controversial problems of this disease.

The work sets out in a clear style and very fully the problems met with in the surgical management of goitre in its different forms. The preparation of the patient, when to operate and the amount of work that can safely be done at one sitting on very sick patients is dealt with at length.

The technique of the different operative procedures has received considerable attention, all of

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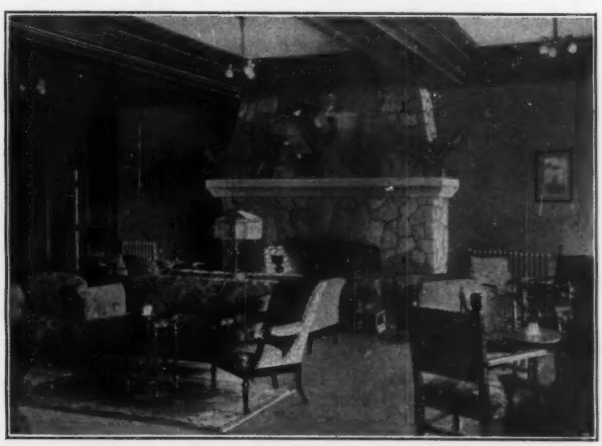

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which is described in detail and greatly clarified by a wealth of illustrations, some 130 of these appearing throughout the volume. Post-operative care and "follow up" treatment has not been overlooked.

The author has drawn freely on the views and works of others for which due credit has been given and this together with his own mature experience has been productive of a reliable guide in the surgery of this affection.

During the past fifteen years great advances have been made in the goitre problem and in these, surgery has participated freely. Gradually there have been evolved certain principles in the surgical management of goitre which to-day are recognized as standard or orthodox and the work under review presents these in a masterly fashion. GORDON S. FAHRNI

A Laboratory Manual of Physiological Chemistry. Elbert W. Rockwood, M.D., Ph.D., Professor of Chemistry and Toxicology in the University of Iowa, and Paul Reed Rockwood, M.D., Fellow in Medicine, the Mayo Foundation. Fifth edition, revised and enlarged. 413 pages; illustrated. F. A. Davis Company, Philadelphia, 1926.

Most laboratory guides serve only for the particular conditions under which the practical course of work is designed but occasionally such a course is adaptable to the needs of other colleges and a manual is officially printed. Such a book is this one which represents the practical courses of the University of Iowa. The subject is developed in the usual way beginning with experiments on the carbohydrates, the "lipoids", the simple and conjugate proteins, then experiments on fermentation, various forms of digestion, and an extensive examination of the blood. This is followed by experiments on bile, the characteristics of distinctive tissues, milk, normal and pathological urines. The book closes with several tables and appendices of useful data. Interspersed amongst the above, occasionally in unfortunate places, are chapters of recently devised experiments on insulin, hydrogen ion concentration phenomena, vitamins and deficient proteins.

Th book is rich in the judicious choice of the best quantitative methods available for the analysis of biological fluids of importance in medicine. This is true not only for the usual nitrogenous substances of blood and urine but also for gaseous and inorganic constituents. A short explanatory paragraph or two serves to introduce each section of the experimental work. E. G. YOUNG

Mind and its disorders. W. H. B. Stoddart. M.D., F.R.C.P. Fifth edition. 593 pages, 87 illustrations. Price 21/- net. H. K. Lewis & Co. Ltd., London, W.C.1., 1926.

Once more this familiar red book appears in a new edition—the fifth since 1908. As in the case of each of the previous editions there has been sufficient improvement in both text and general features to warrant the issue of a revision. The new material included is thoroughly up-to-date, *e.g.*, notes on the tryparsamide and malarial treatments in general paresis, and the short but very comprehensive chapter on epidemic encephalitis. Some new coloured plates have been added and among these are two exceptionally good ones illustrating the gold sol reaction in spinal fluid.

The general plan closely follows that adopted in previous editions and for those who may not be familiar with the book, one may briefly mention its chief characteristics. The title suggests that attention is given to both normal and abnormal activities of mind. and this is so. Part 1, consisting of some one hundred pages, is devoted to normal psychology and one can only say that it is good. True, it contains somewhat more academic physiological psychology than those in the front ranks of the radicals will find acceptable and more "dynamic new psychology" than will please "the last to leave the old aside." The section is, however, an honest attempt to find the *via media* which is, after all, the correct way in a text primarily intended for "students and practitioners of medicine." One does not mean to imply by this that the book will be without interest to those devoting their lives to psychiatry. Throughout, the author has displayed a very fair appreciation for the new work constantly appearing and everywhere one meets with evidences of his own keen powers of observation, description and interpretation. Not everyone will agree with these interpretations, but they reveal the right mental attitude just the same.

Part 2, is devoted to abnormal psychology and consists of chapters on disorders of sensation, perception, association of ideas, emotions, conduct and judgment. In all of these the general body of doctrine is orthodox and is clearly stated. The author's own observations and hypotheses are interesting, and while at times the latter seem a little tenuous, they are thought provoking. A few years ago Dr. Stoddard became "a loyal disciple of Professor Freud" and his chapter on psychoanalysis is a fairly comprehensive account of Freud's fundamental views. Mention of the work of various modifiers such as Jung and Adler is not made. The section is closed by a short chapter on anomalies of the sexual instinct.

Part 3, or the remainder of the book, consists of accounts of the commonly recognized mental disease entities. In his discussion of the etiology of mental disease generally, the author does not hesitate to speak out in opposition to many traditional theories of and attitudes toward the great problem of prevention. He devotes a chapter of detailed enumeration and description to the so-called stigmata of degeneration. In the heyday of exclusive hereditary influence in the etiology of mental disease, much time and space were devoted to the consideration of these anomalies, but one scarcely expects much attention to be directed to them now-a-days. If one thinks of them as stigmata of *deviation* rather than of *degeneration* and watches their incidence carefully, there does seem to appear a direct relationship between these outward signs and deviations from the indescribable but, as one might say, "felt" normal of mental life.

The neuroses are dealt with along Freudian lines although the author differs from his mentor in a few relatively unimportant particulars. Exopthalmic goitre which has led a decidedly beggarly text-book existence heretofore, being rustled about from one department of medicine to another, in Dr. Stoddard's book finds sanctuary among the neuroses, and is by him considered to be closely related to the anxiety neuroses. The future may well sanction such placing.

Discussion of the psychoses is satisfactory in every way. Classification follows more closely that familiar to Canadian and American physicians than is usual in English works. The clinical descriptions are excellent; pathology is set forth with due reference to recent work, and treatment is conservatively outlined. The three final chapters are devoted to medico-legal questions, methods for microscopical examination of nerve tissue and examinations of the cerebro spinal fluid.

Altogether the book well fulfills its author's aim—a text-book for students and practitioners of medicine. A. T. MATHERS

Medical Case-Taking. A. Mills Kennedy, M.D., 148 pages. Price 5/- net. Edward Arnold & Co., London, W., 1926.

This is clearly written and should be of considerable value to the student first beginning his hospital work. It includes notes on clinical examination which are good as far as they go.